

# **An Examination of Kentville's Environmental History**

A Report for the Town of Kentville Integrated Community  
Sustainability Planning Group,

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# **An Examination of Kentville’s Environmental History: Executive Summary**

**– David Freeland Duke**

The report which follows is the work of twenty-four students from the Acadia University history course HIST 3383, Canadian Environmental History. We contacted the Mayor of Kentville, His Honour David L. Corkum, who in turn passed our information on to Brennan Vogel, the Sustainability Coordinator for the Town of Kentville. We suggested that the work of the Integrated Community Sustainability Planning team may be facilitated by an environmental “baseline” of the historical development of the community and its surroundings. (We were operating on the well-known historical principle that, “you cannot know where you’re going until you see where you’ve been.”) Mr. Vogel received the suggestion warmly and in turn provided us with a list of possible areas of investigation, topics that already have, or are likely to have in the future, significant sustainability dimensions to them.

The chapters in the report are each aspects of the overall research, completed by pairs of students working on particular topics. The first group of chapters deals with aspects of the impact of human activities on Kentville’s environmental history; the second group analyses the impact of nature on Kentville’s environmental history; the final group of chapters are regional in scope, and are designed to provide a general understanding of the environmental history of Kentville’s surroundings and thus offer the reader a better sense of Kentville’s place in the larger environment of the Annapolis Valley.

This is a comprehensive report: the students worked extensively in several different archival holdings, in Kentville, at Acadia University, and elsewhere. They consulted hundreds of municipal documents, including planning strategies, by-laws, council minutes, information reports, and so on, in the Kentville Town Offices. They interviewed or communicated with well over fifty individuals, formally and informally, ranging from local citizens, to scientific and economic experts at Acadia and elsewhere, to government officials both locally and in Halifax. In my estimation, this report is the product of well over seven hundred person-hours of research and its findings are worthy of your consideration.

## ***Major Findings: Human Activities in Kentville***

- Kentville’s current sewer system is adequate for the community’s needs, both at present and for the foreseeable future; however, parts of the town are also suffering the consequences of past decisions that failed to split sanitary sewer lines from the storm sewer system.
- Failure to deal with the problems created by untwinned sanitary sewer / storm sewer lines will likely produce more significant challenges, both for the town in general and for affected residents in particular, if the severity and frequency of severe weather events increase, as is predicted by most General Circulation

Models dealing with climate change effects in the Atlantic Region. These challenges could well affect the sustainability of parts of the community of Kentville.

- Kentville has adapted well historically to dramatic changes in modes of transportation (the river → railway → road traffic) and in transportation patterns.
- The much-maligned one-way system in the downtown core has, popular perception to the contrary, worked quite well since its implementation. Greater attention should be paid to further stimulating a “walkable” community, especially in the downtown core; this again is a primary indicator of community sustainability.
- Although Kentville has been home to a wide variety of secondary industries over the last century, we found little or no evidence of negative consequences associated with previous industrial activities in the town. The policy to site recent industrial enterprises on the town’s outskirts, in one concentrated location, has led to a sustainable and rational development model; the relative proximity of the Industrial Park to the town’s fresh-water wellfield is, however, something that will require careful and vigilant oversight.
- Quarrying no longer represents a significant impact on the town’s environment, although it did so in the past. Today’s relatively small operations, working within provincial frameworks, represent a net benefit to the community and its surroundings as they provide locally-obtained materials for construction and other projects.
- Kentville’s record on municipal waste and dumping is very strong indeed; the decision to bring in a partner-contractor, Valley Waste Resource Management, has led to a highly efficient waste-management system, one that, after some initial concerns, has achieved exceptionally high levels of “buy-in” from members of the community. The close relationship between VWRM and the Town of Kentville in planning and implementing waste-redirection strategies is a hallmark of a sustainable waste management system, and the partners should be challenged to develop even stronger Reduction-Reuse-Recycling policies for the future.
- The Town of Kentville’s recreation policies and planning concerning the use of green space are admirable but not as effective as they could be. There is a clear hierarchy, both budgetary and in terms of maintenance and accessibility, across the recreational spaces within the town. While the Kentville Arena receives the vast majority of the Town’s recreational budget, ParticiPark and Oakdene Park are badly underfunded.
- Oakdene Park’s rehabilitation could be undertaken at a relatively low cost and would serve as a signal to the inhabitants of North Kentville that their neighbourhood is an important part of the community. A well-maintained and well-patrolled green space, possessing family-friendly recreational facilities, has a positive impact on community well-being, property values (and hence the tax base of the town), and therefore on the community’s overall sustainability as well.
- With a few budgetary adjustments and a commitment of the Town Council and Parks and Recreation to identify, fund, and encourage ways to increase

participation and revenue sources within less well-known greenspaces, the major imbalances that characterise the Town's recreational priorities could be easily solved. The Town Council has clearly demonstrated such agility in its development of the Kentville Trail and even more so in its widely-recognised partnership with Ducks Unlimited Canada to rehabilitate the Miner Marsh.

### ***Major Findings: Nature's Impact on Kentville***

- The Town's present water supply is resilient and well-managed, especially since the shift to groundwater exploitation. The supply is based on a diversified water source (bedrock and surficial aquifer access), is of a very high quality, and is subject to rigorous testing.
- However, the sustainability of the water supply is less than certain, given the limited knowledge of the aquifers on which the water supply rests, especially concerning recharge rates and the impact of severe weather events such as droughts. The system also faces potential threats from the concentrated location of the supply wells and their potential susceptibility to contamination, particularly from road salt or from an accident in the Industrial Park.
- Severe weather events, mentioned several times already, are a fact of life in Kentville's environmental history: they have happened regularly in the past, and they will happen regularly in the future. Indeed, several models predict they will happen with greater severity and frequency.
- For much of the town's history, response to natural disasters such as storms, floods, and droughts was on an *ad hoc* basis: community response was admirable, with many stories of neighbours helping neighbours, but only recently have broadly-based, general-response Emergency Management Plans been drawn up by the town. On paper these plans are very robust and in practice handled the Spring 2003 flooding event well. It should be recognised, however, that it is more than thirty years since the town has faced a major storm of the magnitude of Hurricane Edna (1954) or the Groundhog Day Storm (1976). We were lucky to escape the devastation of Hurricane Juan, but an event of that severity is in the town's future and if we are unprepared it could affect the community's sustainability.
- There is nothing that generated greater controversy in this report as it was being researched than the topic of the Town's floodplain management history. The origin of the Town's current baseline figures delineating areas of flood risk, especially the "nine-metre mark," could not be uncovered by the researchers, nor could town personnel who were interviewed identify the source of the figure. It is urgent that the floodplain zone be remapped, if for no other reason than to gain access to this exceedingly important information.
- A significant portion of the town's inhabitants live in the zone that is susceptible to flooding, and they have suffered floods' effects repeatedly in the past. It is not enough to dismiss these citizens as "having got there on their own two feet", so to speak: it is clear that property sales do not as a matter of course include discussions concerning flood susceptibility and, while the principle of *caveat emptor* necessarily remains true in general terms, it should be the highest

priority of a community that wishes to call itself such to reach out and to find cost-effective and sustainable solutions to the fact – note, the *fact* – that a small but significant portion of its population lives in untenable circumstances. We feel that the existence of these flood-threatened neighbourhoods represents a significant potential threat to the community’s of Kentville’s long-term sustainability.

- The relationship between the Town of Kentville and the Municipality of Kings County is a complicating factor concerning floodplain management of the Meadowview community located just outside the town’s limits. The physical location of Meadowview still requires its needs to be taken into account when developing policies concerning the floodplain management of the Cornwallis on the river’s south side; it is clear from our research that flood-control measures undertaken by the town are at least perceived by the community to represent a significant potential risk to the Meadowview inhabitants. It is therefore urgent that measures are taken to combine the resources and planning capabilities of both the Town and Municipality to address the concerns of the citizens of the Meadowview community in regards to the issue of flooding along that stretch of the Cornwallis river.
- On its face, it seems as if the development of the Seniors’ Living Complex on the site of the old rail yards is in contravention of the Province of Nova Scotia’s “Statement of Provincial Interest” section of the Municipal Government Act of 1999. Given that, historically, the rail yards have been subject to flooding, and the land there forms part of the Cornwallis River’s floodway fringe, current and future development on the land should be considered very carefully.

### ***Major Findings: Surroundings***

- Agriculture in the Annapolis Valley, and particularly around Kentville, has demonstrated very strong durability, surviving natural disasters and the wholesale loss of its export market in the middle of the twentieth century.
- However, local agriculture today faces monumental challenges in terms of market accessibility, production costs, and extra-regional competition.
- Two possible trends could boost the sustainability of local agriculture: one is the move toward local production / local consumption as exemplified by farmers’ markets and “100 mile” movements. A number of factors work against this trend, but even if it only remains a small part of the agricultural economy, local consumption and self-sufficiency policies should be encouraged.
- The other possible trend is continued specialisation of the Valley’s agricultural industry; new fruit varieties promise significant market share, and if the province were to move toward tight specialisations, production would likely gravitate to apples and blueberries, traditional strengths of the Valley’s agricultural sector.
- Whatever direction is chosen it will be the result of a combination of driving factors: government and competitive forces will be important, but by far the strongest driver will be the demands of the consumer, locally, regionally, and beyond.

- A significant factor in the future of the region’s agriculture, and indeed its urban environment, will hinge on the application of pesticides and genetically-modified organisms. Insufficient community discussions have been undertaken on these subjects which, for an agricultural region, is surprising.
- One policy, both symbolic and practical, that the Town of Kentville can undertake in this regard is a ban on the use of cosmetic pesticides for the purposes of garden beautification; this policy would reflect rising concerns among the broader Nova Scotian community concerning the use of these compounds, and would contribute to the environmental sustainability of the town.
- The Cornwallis River has suffered enormous environmental insults over the twentieth century. Although the situation has improved somewhat in recent years, further amelioration efforts are hampered by the fact that there is no strong government enforcement discouraging activities that can lead to the pollution of the river.
- One single, clearly defined group, enjoying government access, and dedicated to the testing and treatment of the river’s water and the prevention of its pollution, needs to be established.
- More cooperation among the communities through which the river flows needs to be established, and broader education efforts concerning activities that can help to return the river to health need to be undertaken.

\* \* \*

# ***SECTION 1 – HUMANS***

# Chapter 1: Kentville Sanitary Sewage Management

## – *Drew Karavos and Michelle O’Grady*

### Introduction

The town of Kentville has long been looking for an adequate solution to deal with the removal of sewage. From the early- to mid-20<sup>th</sup> century, there seems to have been a lack of concern over where sewage ended up and what sort of environmental impact it had. It seems that as late as 1936, sewage was not yet under the jurisdiction of the municipality. Insurance maps of the town show that in the 1920s and up to the mid-1930s, most houses and many public buildings in the town had an outhouse on the property, indicating that sewage disposal was still the responsibility of each individual household.<sup>1</sup>

Though records regarding the town’s sewage prior to the 1960s are difficult to come by, it is clear that at some point between 1936 and 1963, the town implemented a sewage management system to replace the widespread use of outhouses across town. It is unclear why the town decided to switch when it did. Perhaps with the population of the town growing, and on the basis of an expectation that it would continue to grow,<sup>2</sup> a sewer system was seen as vital in order for the town to continue to attract commerce, or vice versa. Nonetheless, the first municipal sewer system was implemented at some point during this 27 year period. The sewer system implemented was a combined sewer system, collecting both sanitary sewage as well as storm water runoff. While a combined sewer system was the cheaper alternative to build, it also included at least one major drawback: unlike a separated sewer system, in which sanitary sewage and storm water are handled independently of one another, a combined sewer system has a tendency to overflow due to fluctuations in flow caused by the weather. From the time that large-scale discussions concerning sewage began in Kentville in the early 1960s, this tendency to overflow was one of the major concerns of the Town Council. Amalgating the sewer system was always seen as something that would eventually need to be done, but was put off time and time again because of the high cost of doing so.

### Identifying the Problem

When the system was put in place between 1936 and 1963, however, the overflow problem was not foreseen. Nor was there any concern over the practice of dumping untreated sewage directly into the Cornwallis River, which is exactly what the town did. From the time the sewage system was implemented, sewage was deposited directly into the Cornwallis River without receiving any treatment. According to the town’s 1979 Municipal Development Plan, there were seven main outfalls, as well as a large number of private individual sewer lines that deposited directly into the Cornwallis River nearly 500,000 imperial gallons (2,275,000 litres) of raw sewage every day.<sup>3</sup> And this was just from the town of Kentville alone. Prior to the late 1970s, each town in the region handled of its own sewage, with many others, such as Wolfville and Coldbrook, also dumping their untreated sewage in the river. It goes without saying that over time there were serious environmental effects associated with the dumping of raw sewage in the river in such high volumes. The fact that such a system was even put in place is indicative of people’s attitudes at the time regarding the health of their environment, or perhaps of an ignorance of the effects of their activities on their environment.

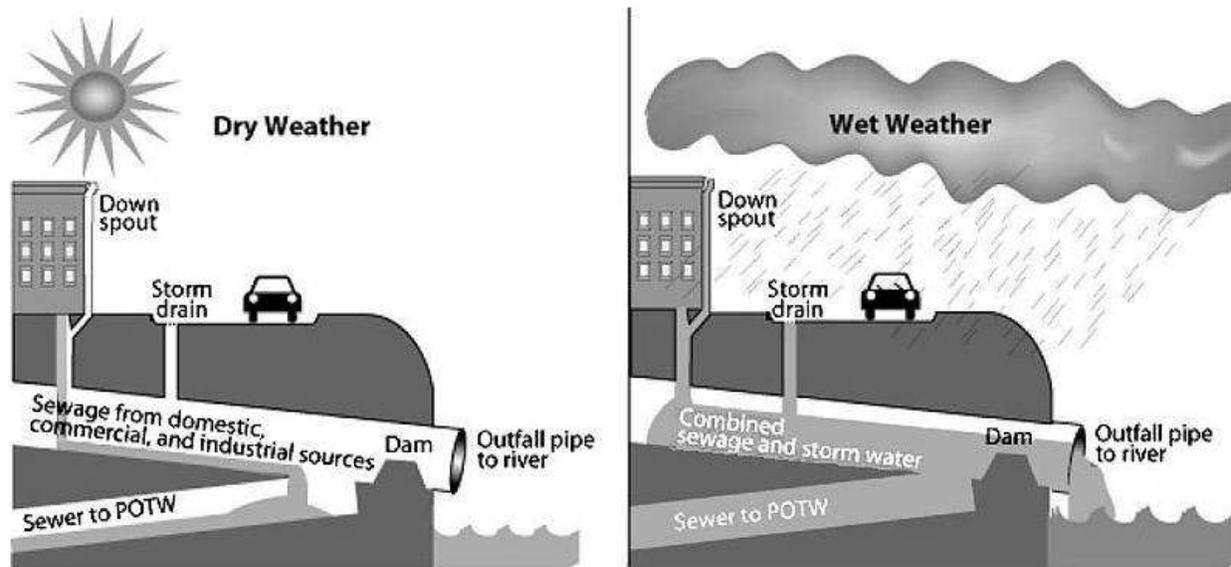


Fig. 1: An example of a combined sanitary and storm water system. The image on the right depicts what can occur with heavy storm waters entering the system and overflowing.<sup>4</sup>

But by the 1960s it was becoming clear that this practice of dumping raw sewage into the Cornwallis River was in need of reform. In 1963 the town of Kentville produced the report *Kentville Looks Forward* that was intended to be a blueprint for future development over the following 15 years; commercial and industrial development was the central focus of the plan. In part, the report outlined the major problems with the sewage system as it then existed. Most notable of these problems, according to the plan's authors, was the pollution it engendered. The report cited an earlier study prepared by the Province of Nova Scotia, which found "alarming rates of pollution and contamination in the [Cornwallis] River near Kentville."<sup>5</sup> *Kentville Looks Forward* called for a separate engineering study to be prepared to determine the carrying capacity of the sewage system as it existed, to determine the amount of storm flow carried by the system (and to find ways of eliminating as much of it as possible), to determine if it was possible to consolidate the current nine-sewer outlet system to reduce the amount of treatment and maintenance required, and to find sites suitable for future treatment facilities.<sup>6</sup> Although such a report was not produced until 1976, it is clear that by 1963 there was growing concern over the pollution levels in the Cornwallis River caused by sewage dumping. At this point, the town was aware that they would eventually need to start treating sewage before dumping it in the river in order to stop the contamination of the river.

### The 1970s and After: Cooperation

By the mid-1970s, the idea of cooperation among the towns of the Wolfville-Coldbrook corridor in collecting and treating sewage had grown in popularity. In a 1975 Town Council meeting there was some discussion of such a regional cooperation. It was decided at this time that the then-current system, wherein each municipality dealt with its own sewage, was no longer the best way to handle the sewage problem.<sup>7</sup> The town also recognized at this time that although implementing a new sewage system would be expensive, it was becoming increasingly necessary.<sup>8</sup> With regional cooperation, however, some of the heavy costs of implementing the sewage treatment system could be shared and the inefficiencies reduced. The town of Kentville,

along with others, began to stress to the provincial government the importance of regional cooperation in dealing with the sewage problem.

The engineering study that took place over the period 1976-1978 reached several conclusions. First and foremost among these was that regional cooperation was the best way to go. It recommended a sewage line that started in Coldbrook, went through Kentville, and ended at a treatment plant that would be built in New Minas. It also recommended that Kentville pay a larger sum of the construction costs as it would be the major user of the system. The study recommended as well that Kentville be allocated a certain portion of the total capacity of the system.<sup>9</sup> There was some concern amongst the other communities that Kentville would reject the proposed regional sewage line because of the higher costs to their community, and planned an alternate system that would by-pass the town of Kentville, should they have chosen not to participate. In the end, Kentville town council accepted the proposal, and the regional sewage system went ahead as planned.

The new sewage treatment system was up and running for the first 100 homes in Kentville by the week of 14 September 1978. At this early stage, the sewage was collected and treated in a lagoon-style sewage treatment facility on the dykelands below Wolfville,<sup>10</sup> though when the system was completed in the fall of 1979 sewage from the Coldbrook-New Minas corridor was collected and treated in a new facility located next to the Cornwallis River in New Minas. By 28 September 1978, additions were made to the sewer plans, to include installations that would divert storm waters away from the sewer lines. This would reduce the possibility of an overload, at the cost of an additional \$500,000 to the project.<sup>11</sup>

The Municipal Development Plan approved in October 1980 was the first such report to come out of the town of Kentville directly. It was approved just two years following the implementation of the new sewer system, and contained a section regarding environmental health services, including a subsection specifically discussing the sanitary and storm sewage system. According to this document, 95% of the existing development in the town of Kentville was serviced by the sanitary sewage system by the fall of 1979.<sup>12</sup> The other 5% of the town's development presumably could not be serviced by the regional sewage system because it was located on land too steep for the lines to run.<sup>13</sup> Residents of these areas of the town would have used septic tanks or even outhouses instead. The regional sewage system opened up approximately 300 acres of vacant land in the west end for potential commercial or residential development. One of the primary concerns that still remained after the implementation of the regional sewage system was the need to implement a separate storm sewer system in order to alleviate the amount of water that would need to be treated.

There are many reasons why the new sewage collection and treatment system was implemented when it was. Besides the growing concern over the environmental impact of the old system on the river, the primary factor was cost. Because of a slump in the economy, contract workers were readily and cheaply available for work. Besides the cheap labour, the federal government was keen to give out grants to help bolster the economy.<sup>14</sup> It was estimated that the cost of the project for the town of Kentville was \$700,000, of which the town hoped between \$100,000 and \$150,000 would be covered by a federal grant.<sup>15</sup> In August 1978, however, MPA Glenn Ells announced that the federal government grant to the town of Kentville to upgrade the water and sewer services would total a surprising \$260,000.<sup>16</sup> Some of

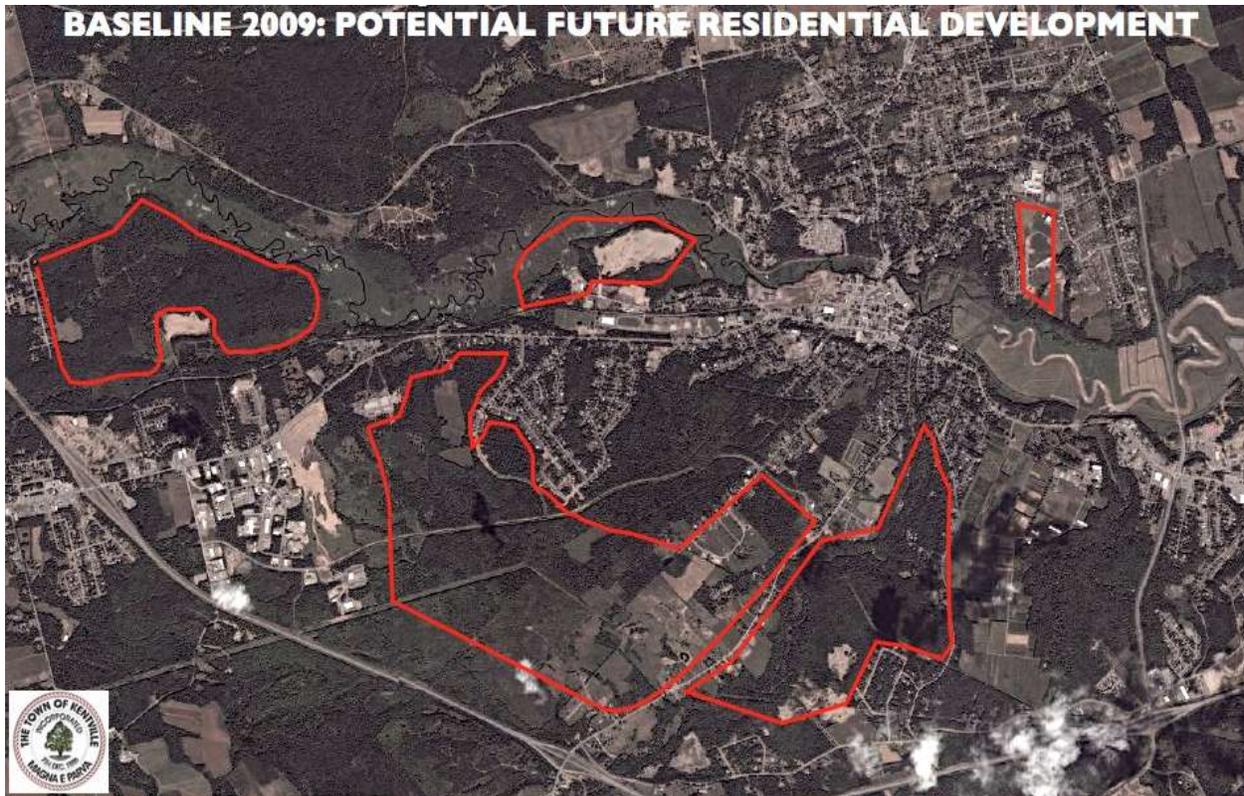
the bill was also expected to be shared by local industries, including Scotian Gold Co-operative Ltd., ACA Cooperative, Hostess Food Ltd., and Canada Foods Ltd.<sup>17</sup>

In 1994, the town of Kentville developed a second Municipal Planning Strategy. Much of what is stated in this new document regarding sewage collection and treatment was echoed in the 1980 document. There is a brief description of the system itself, as well as the problems with the system prior to 1979. There is also some discussion regarding the concern in the town over Kentville's allocated portion of the total flow capacity of the sewage system. As a bulk user of the system and with the town's population and industry expected to continue to experience continued growth, there was a rising concern that either Kentville would need a greater portion of the system's capacity allocated to it, or that the treatment plant would have to be expanded in order to meet these growing needs.<sup>18</sup>

### Strategies and Plans Since 2000

A third Municipal Planning Strategy was drafted by the Town of Kentville Planning and Development Department in 2001, with the section regarding sewage once again repeating much of what had already been stated in the 1980 and 1994 documents. The fact that even the wording of these three documents is almost identical is indicative of the fact that over the 20 year period following the implementation of the regional sewage system there was little to no significant changes to either the structure or operation of the system. As with the previous planning strategies, the 2001 document expresses the town's fear that the portion of the total capacity of the system that it had been allocated was not going to be enough in the coming years.<sup>19</sup> Policy ES-18 of the Municipal Planning Strategy states that "It shall be the intention of Town Council to ensure adequate capacity is available within the Regional Sanitary Sewage System to meet present and future needs of the town,"<sup>20</sup> although the document gives no indication of how the town intended to ensure this. After the release of the Municipal Planning Strategy in 2001, an amendment was made in 2003 to the Kentville by-laws. The amendment, enacted in May of that year, stated that the town was to assume the costs of the installation and maintenance of the sewer laterals. The original by-law stated that the residents themselves were responsible for bearing these costs.<sup>21</sup>

Over the course of the next few years, minor adjustments to the budget were the only changes implemented regarding the regional sewer system. But in 2005 Town Council began discussing upgrades that needed to be made to significant sections of sewer lines in Kentville. These capital construction projects were to be undertaken along Oakdene Avenue and River Street.<sup>22</sup> There were no specific details of what needed to be done in these early discussions, but in 2006 a Capital Works Program was presented to Town Council, which included projects for upgrades to the sewer lines along River Street, Cornwallis Street to Hartlen Court, and Oakdene Avenue. This project, which had expanded from 2005 to include two new areas, would require around \$260,000 capital investment for 2006/2007.<sup>23</sup>

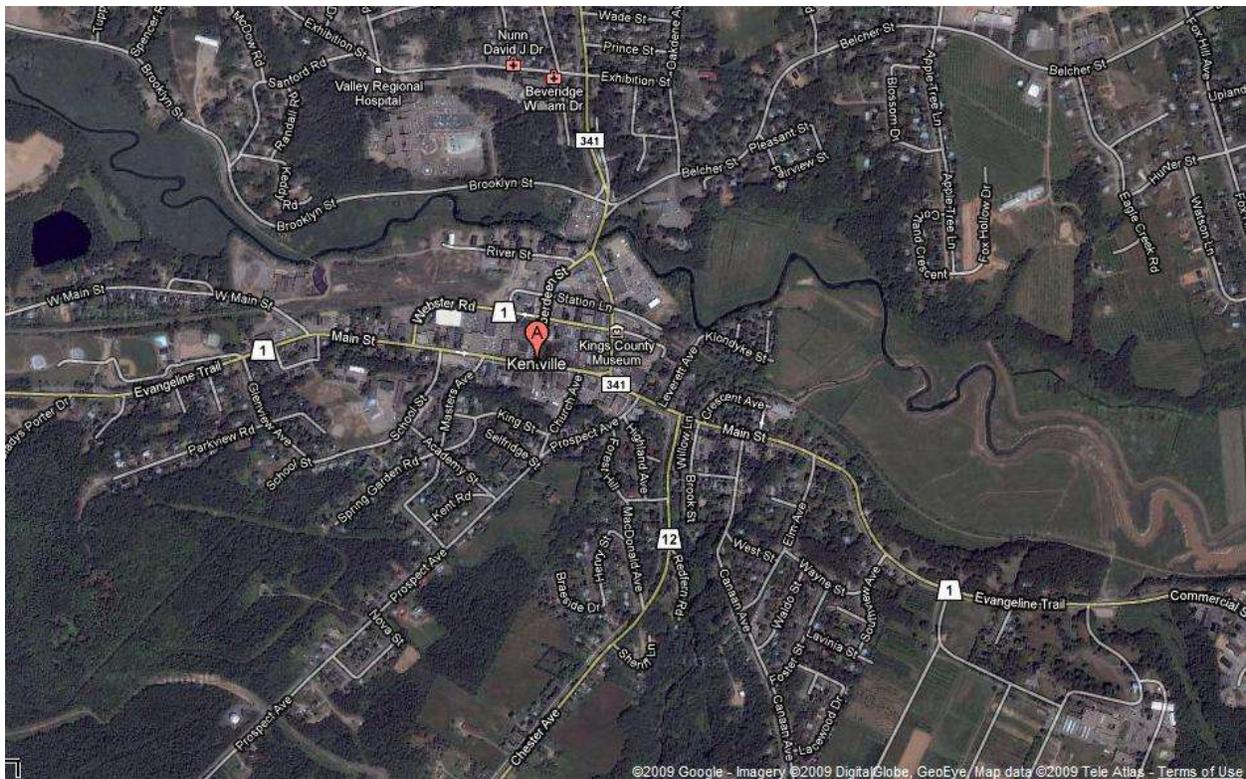


*Fig. 2: The areas outlined in red show the areas expected to have residential development in the coming years and will no doubt need to be serviced by the regional sewage system. Image courtesy of Brennan Vogel.*

Presently, Kentville is still connected to the Regional Sanitary Sewage System. Regional cooperation has proven over time to be a more efficient way of dealing with sewage collection and treatment in the Annapolis Valley. There are now a total of eight treatment plants in the region, including: Hants Border, Avonport, Canning, Wolfville, Aldershot, Waterville, Aylesford, New Minas, and Greenwood.<sup>24</sup> Kentville is still serviced by the New Minas treatment plant, along with Coldbrook and the village of New Minas.<sup>25</sup> Besides servicing these towns, the plant is also responsible for treating the industrial waste produced by a number of private industries.<sup>26</sup> The treatment plant that is located in New Minas is the largest of the eight in the Annapolis Valley region. As the population and industry in the Annapolis Valley, including Kentville, continues to grow, there is a growing concern that the sewage system will need to be updated to accommodate a greater capacity.<sup>27</sup>

In January of 2007, the largest sewage-related project since the completion of the regional system in 1979 was presented to Kentville's town council. The council was presented with the concept of constructing a new treatment plant in Kentville that would collect and treat sewage from Kentville and Coldbrook<sup>28</sup>. With the construction of this treatment plant, the town of Kentville would own and operate the transmission lines. One of the proposed locations to build this treatment plant was on the dykelands, at the town's east end. It would treat waste water to meet proposed 2009 regulations. The cost of such a large construction project was estimated to be around \$4,795,000.<sup>29</sup> As of early 2010 the Kentville treatment plant is still just an idea in the early stages of discussion.

In 2007, Kentville’s sewage continued to be pumped and collected through the town’s lines to the regional station and then on to the treatment plant in New Minas.<sup>30</sup> At this point, a capital budget was proposed which included three projects for 2007 and 2008. One of these projects was a reformulation of the proposals offered in 2006. Additionally, the completion of the sewer main on River Street, the renewal of sewer mains and laterals to property lines on Crescent Avenue, and the replacement of the sewer pumps in the West Main Street Lift Station were all proposed as well.<sup>31</sup> Around this time the regional sewer system was being analyzed and critiqued. Due to difficulties handling fat, oil, and grease, there were problems within the system that necessitated upgrades to the regional sewer system. Companies that were primarily responsible for these problems are Apple Valley Foods, Sarsfield Foods, and Eastern Protein.<sup>32</sup> There were two possible solutions presented. The first was to proceed with the sewer by-law and insist that these companies meet domestic requirements in their disposal of fatty or oily waste in the sewage system. The second solution was to legislate a by-law that would allow pre-treatment to be done by the companies and would not affect the town’s capacity.<sup>33</sup> The second solution was very important because as indicated above, the continued growth within the town of Kentville has to be taken into consideration with regards to the capacity of the treatment plant. The new bylaw was therefore seen as the more reasonable and achievable of the two proposed solutions.



*Fig. 3: The dykelands on the east end of town (the open area on the river on the right side of the map) have been selected as an ideal location for a potential treatment plant in the town of Kentville.<sup>34</sup>*

Since the completion of the regional sewage system in the fall of 1979, there have been only minor changes to the policy regarding sewage, and no major structural changes. The Regional Sanitary Sewer Treatment Plant is currently operated by the County of Kings, with costs for sewage collection and treatment shared between King’s County, Kentville, and New

Minas.<sup>35</sup> The Nova Scotia Department of Environment and Labour closely monitors the treatment plant by collecting, testing, and analyzing water samples on a weekly basis, and sampling industrial users on a daily basis.<sup>36</sup> While the plans for a Kentville treatment plant are still in the very early stages of development, there are three ongoing capital projects, which involve School/Glenview Avenues, Nichols Avenue, and River Street. This capital project, including River Street, has been talked about and planned for since 2005 and many locations have been added and removed from the list quite frequently with River Street being the only one to stay the on the list since the capital projects were first presented to Town Council in 2005.<sup>37</sup> These are the areas that are the most prone to flooding in Kentville. The capital projects are intended to renew the sewer systems in place to ensure they can handle higher capacities.

### Conclusion

In conclusion, the system of sewage collection and treatment in place in Kentville is adequate. It has kept up with population growth and commercial development in the town. The only major concern deals with the twinning of the sanitary and storm sewers in the old areas of development in the town. To twin the sewer lines in these areas would be not only costly but also an inconvenience to the residents of those areas, and it is our opinion therefore that the town should seek out alternative solutions to the flooding problems in these areas that would cost fewer tax dollars to implement.

<sup>1</sup> Insurance maps of the Town of Kentville; 1921, 1927, and 1936. King's County Museum Archives.

<sup>2</sup> *Kentville Looks Forward*, 1963, p. 5. Esther Clark Wright archives of Acadia University.

<sup>3</sup> Town of Kentville Planning and Development Department, *Municipal Development Plan 1980*, p 55.

<sup>4</sup> Image Source: US Environmental Protection Agency Online, [http://www.epa.gov/npdes/pubs/cossoRTC2004\\_chapter02.pdf](http://www.epa.gov/npdes/pubs/cossoRTC2004_chapter02.pdf), p 2-2.

<sup>5</sup> *Kentville Looks Forward*, pp. 15-16.

<sup>6</sup> *Kentville Looks Forward*, pp. 15-16.

<sup>7</sup> Kentville Town Council, 1975, document found at Kings Country Museum, p. 34.

<sup>8</sup> Kentville Town Council, 1975, p. 34.

<sup>9</sup> Regional Water and Sewerage Study, completed in 1978, document found at Town of Kentville Archives, p. 4.

<sup>10</sup> "Sewage System Completion Next Week," *The Advertiser*, September 7, 1978, p. 1.

<sup>11</sup> "Sewage System Completion Next Week," *The Advertiser*, September 7, 1978, pp. 1-2.

<sup>12</sup> Town of Kentville Planning and Development Department, *Municipal Development Plan 1980*, p. 55.

<sup>13</sup> Town of Kentville Planning and Development Department, *Municipal Planning Strategy 1994*, p. 14-15.

<sup>14</sup> "Town Committed to Sewage Treatment," *The Advertiser* August 17, 1978, p. 2.

<sup>15</sup> "Town Committed to Sewage Treatment," *The Advertiser* August 17, 1978, p. 1.

<sup>16</sup> "Ells Announces \$260,000 Grant," *The Advertiser*, August 24, 1978, p. 1.

<sup>17</sup> "Town Committed to Sewage Treatment," *The Advertiser* August 17, 1978, p.2.

<sup>18</sup> Town of Kentville Planning and Development Department, *Municipal Planning Strategy 1994*, p. 137.

<sup>19</sup> Town of Kentville Planning and Development Department, *Municipal Planning Strategy 2001*, p. 101.

<sup>20</sup> Town of Kentville Planning and Development Department, *Municipal Planning Strategy 2001*, p. 101.

<sup>21</sup> Council Minutes of Town of Kentville, March 12<sup>th</sup>, 2003.

<sup>22</sup> Council Minutes of Town of Kentville, June 8<sup>th</sup>, 2005.

<sup>23</sup> Council Minutes of Town of Kentville, June 14<sup>th</sup>, 2006.

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- <sup>24</sup> Municipality of the County of Kings, “Municipal Sewer Services,” Kings County, <http://www.county.kings.ns.ca/engpw/sewerser.htm>
- <sup>25</sup> Town of Kentville Planning and Development Department, *Municipal Planning Strategy 2001*, p. 95. <http://www.kentville.ca/documents/MunicipalPlanningStrategy.pdf>
- <sup>26</sup> Municipality of the County of Kings, “Municipal Sewer Services,” Kings County.
- <sup>27</sup> Town of Kentville Planning and Development Department, *Municipal Planning Strategy 2001*, p. 95.
- <sup>28</sup> Council Minutes of Town of Kentville, January 29<sup>th</sup>, 2007.
- <sup>29</sup> Council Minutes of Town of Kentville, January 29<sup>th</sup>, 2007.
- <sup>30</sup> CAC Minutes of Town of Kentville, June 25<sup>th</sup>, 2007.
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- <sup>32</sup> CAC Minutes of Town of Kentville, October 29<sup>th</sup>, 2007.
- <sup>33</sup> CAC Minutes of Town of Kentville, October 29<sup>th</sup>, 2007.
- <sup>34</sup> Source: Google Maps.
- <sup>35</sup> Council Minutes of Town of Kentville, May 25<sup>th</sup>, 2009.
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## Chapter 2: Storm and Surface Water Management – *Chris Cartwright and Kevin Garbuio*

### Introduction

We are all aware that Kentville and the rest of Kings County and the Annapolis Valley are prone to dealing with storms and their associated surface water runoff. We know that storm and surface water is something that the community of Kentville in particular has dealt with since the town was first established, especially given its situation on a floodplain surrounded by steep gradients. It is therefore important that management of storm and surface water receive a high priority from the town because it is something that has always been a struggle to manage. We can use the flood of 2003 as an example of this. From our research, managing storm and surface water has been an ongoing issue for the town and has been brought up many times throughout the Municipal Planning Strategies (MPS) and town meetings in Kentville. There has always been an issue with the storm and surface water, but it seems that every year it is still something that still needs to be acted on. It is clear from our research that the need for a system to manage the storm and surface water separately from sewage is very great; indeed, this is a fact that has been recognized repeatedly over the last half century by town planners themselves. Throughout this chapter, we address the issues and history of management of storm and surface water in Kentville. We will attempt to demonstrate that an examination of the history of Kentville's prior management of storm and surface water can illuminate the ongoing issues facing the town today, and how those issues should be addressed in the future.

### Background and history of storm and surface water management

When interviewing Bev Gentleman, Director of Planning and Development, Greg Kehoe, Director of Engineering and Public Works, and Hal Henderson, the former holder of this office, at the town hall in Kentville, each made it clear that there is no concrete information concerning storm system establishment in Kentville. There are, for example, no town maps from the nineteenth or early twentieth centuries that show the storm system.<sup>1</sup> The system as it stands is something that has developed over time.<sup>2</sup> This is what makes this topic an interesting but difficult subject to cover; there is no real timeline to this topic like most things in history. Before the 1970s storm runoff, rainwater, and water waste all ended up untreated in the Cornwallis River.<sup>3</sup> The river was therefore the dumping location not just for sewage, but also for storm and surface water. According to Hal Henderson, one of the first things the town did in the early 1980s, in cooperation with other communities like Coldbrook and New Minas, was develop a combined sewer treatment plant to manage these liquid effluents.<sup>4</sup> According to Henderson this accord was something that was ahead of its time.<sup>5</sup> Before the completion of this new system, "100% of raw sewage from Kentville was being discharged into the Cornwallis River."<sup>6</sup> The employment of the river as a dumpsite for all municipal liquid runoff prior to the 1970s, combined with substantial quantities of agricultural contamination, led the river to be declared among the top ten most endangered rivers in the country.<sup>7</sup>



Figure 1: The Cornwallis River near high tide; photograph from Port Williams Bridge looking upstream.  
Source: Wikipedia [http://en.wikipedia.org/wiki/Cornwallis\\_River](http://en.wikipedia.org/wiki/Cornwallis_River)

In the Municipal Planning Strategy of 1980, it was written that at that time, at least within Kentville, a combined storm and sanitary sewer system was still in existence.<sup>8</sup> Under policy F-2 of the Municipal Development Plan (MDP) of 1980 it was recorded that “it shall be the intent of council to separate existing combination storm and sanitary sewer lines whenever possible.”<sup>9</sup> This suggested that Council recognized that there needed to be a separate system in place for storm water and surface water management. But this was not the first time that this was mentioned in the history of municipal development planning in Kentville. In the MDP of 1976, it was stated that “it has been the policy of the town since 1961 to require separate storm and sanitary sewers in new development.”<sup>10</sup> This suggests strongly that the town of Kentville faced problems with floods and sewer backups prior to 1961, since the new policy emanated from that date.

The problem with not having separate storm and sanitary sewers in Kentville is that when there is too much water or sewage going into the treatment plant and sewers in the town, it can cause backups in neighbourhoods or in people’s homes and businesses. In these circumstances flooding can occur because the water has nowhere to drain, especially when there has been heavy rainfall or rapid melting of snow. The traditional reason, according to the town directors, for not separating the storm and sanitary sewers in the past has always been the high cost associated with doing so.<sup>11</sup> Although earlier MDPs had included statements committing developers to separate storm and sewage systems, it was not until 1990 that the policy of separated systems became law for new developments.<sup>12</sup>

In Figure 2 below, of the storm sewer line flowing into the Cornwallis near the Shannex seniors’ complex, a sense can be gained of the coverage mandated for recent developments in the town. However, older, more established areas do not possess comparable dedicated systems, and problems result. This is especially true of the West Main area of Kentville, which

historically has been the area most prone to flooding and a part of Kentville that experienced serious damage in the 2003 flood.



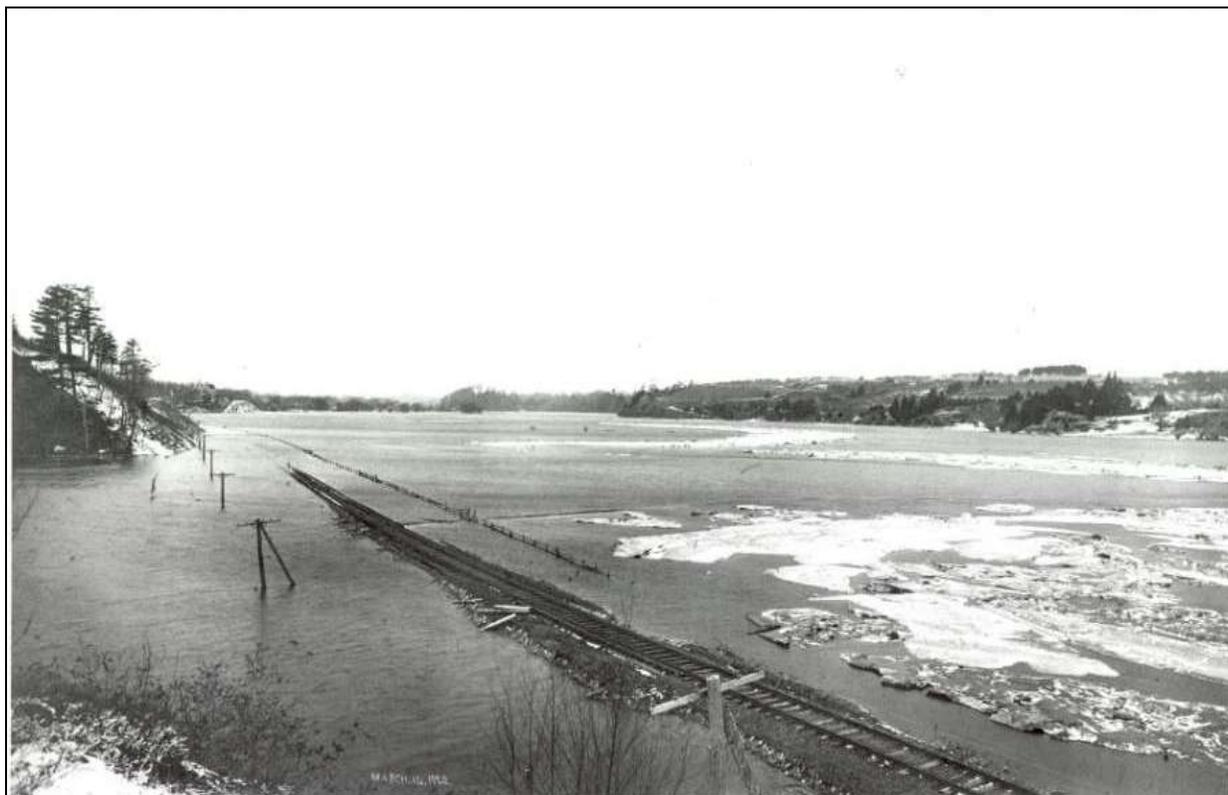
*Figure 2: Storm sewer culvert draining into the Cornwallis below the Shannex development on the former CN Rail lands. Picture courtesy of Greg Kehoe.*

With the information that we have and the problems that Kentville has experienced with flooding and the backing up of the water systems, our conclusion is that action needs to be taken to address the current system on West Main Street and in several other locations in town. The town has known about the problem as far back as 1961, but since then there still has been no major effort to separate the systems in that area. It has been stated that it is too expensive to make changes in that area and to do that the town would have to ask the residents of the area to allow major construction on their land to separate the system.<sup>13</sup> According to Directors of the town of Kentville, it would be very unlikely that people would allow construction to be undertaken that would interfere with the integrity of their property.

### Flood of March 31<sup>st</sup>, 2003

On March 31<sup>st</sup>, 2003, Kentville experienced a significant rainfall event on ground that was still frozen from the previous winter season. Normally, ground and soil can be considered to be a natural storm and surface water management system because when rainfall hits soil, it is

usually absorbed. When the ground is frozen, however, rainfall water cannot be absorbed so massive runoff can result, exceeding the capacity of storm sewer systems. It is in these circumstances when we can see water backing up from the sewers; this phenomenon is the underlying cause of the major flooding along the West Main Street area and other parts of Kentville in 2003. Similar circumstances led to spring flooding, in much the same way, in 1920, 1931, 1962 and 1972. These floods all occurred during the period from mid-late February to early April. Their regular occurrence suggests strongly that spring flooding caused by storms dumping large amounts of precipitation on frozen, impermeable ground are recurrent events that have overwhelmed the town's runoff-management systems regularly in the past. They will do so again, affecting the older areas of town serviced by those older systems, unless those systems are upgraded.



*Figure 3: Flooded railway track on the dykelands to the east of Kentville. March 14, 1920. A. L. Hardy Photo Collection, Acc. No. P.992.132.1 Photograph courtesy of Kings County Museum.*

*This picture indicates the potential for spring flooding as the river bursts its banks in the face of ice-dams and with the inflow of spring meltwater.*

### Issues

The Town of Kentville, as we have stated, continues to face serious issues in regards to its storm sewer system. The most prevalent issue is that in some areas (West Main) the storm water systems have still not been separated from the sewage. This can be a problem when there are storms, excessive melting, and flooding. Our colleagues Sarah Story and Miranda Saroli informed us that when there is flooding the sewage can end up backing up into people's basements. The town must address these issues in our view. We recognize, however, the

substantial challenges facing the town in this endeavour, by far the biggest being the town's financial situation. In talking to municipal officials at town hall, all agreed that the town has trouble putting plans into place involving the storm sewers for the simple reason that it is too expensive.<sup>14</sup> To make the changes necessary to upgrade the storm and sewage lines is not in the town's budget or plans at this point.<sup>15</sup> Another disadvantage is the town's topography. If one was to observe the town they would see that the landscape of Kentville is made up of hills, slopes, valleys and low lands. While this can be beneficial (as will be mentioned shortly), it is expensive to develop underground infrastructure in the area. It was mentioned in the 1976 MPS that the topography forced the town to spend extra money in the construction of lift stations for pumping purposes and in the establishment of other remedial storm sewer installations.<sup>16</sup>

In reviewing the history of the town's Municipal Development Plans, it is clear that past strategies have sought to use natural features to the town's advantage wherever possible. Existing watercourses have been employed as natural runoff channels, therefore working with nature, and reducing costs in the process. We wonder whether further planning of this nature may be explored as part of the town's Sustainable Community Planning initiative. Previous town policies have been progressive in encompassing these methods all the way back to the 1970s. It is impressive for the town to have been as environmentally conscious as it was in this regard, especially in that period. But, as indicated above, it is clear that monetary issues are the biggest hurdle that the town needs to overcome. Currently it would be hard to achieve any major goal because of the economic situation that the province and the country currently face, but it would be forward-looking if the town began to plan accordingly and to prioritize the search for funding to comprehensively overhaul its storm and surface water handling infrastructure.

### The Recent Development of Sewer Infrastructure in Kentville

Despite the issues that the Town of Kentville has had to confront because of the fiscal and geographic shortcomings as well as the inherited, unseparated system that currently exists in the older parts of town, Kentville has managed to move steadily forward over the last half century. Before 1963, the town experienced major issues with its storm and sewage sewer systems, especially with backups.<sup>17</sup> The 1963 MPS stated that "a definite stand must be taken to construct proper storm sewers adequate to take future flows."<sup>18</sup> In 1961, the "town's policy was to require separate storm and sanitary sewers in new development."<sup>19</sup> Although this separated system policy has been adhered to in new developments, older systems, such as those along West Main and elsewhere, remain undifferentiated, and problems have resulted and will likely continue to do so until the situation is rectified.

In 1976 a new set of sewer policies were enacted. Since the 1961 policy had yet to have much of an impact on the community, the town had to figure out ways to address the financial situation caused by the pumping stations due to the topography of Kentville. The town's plan was to use the existing natural drainage systems that were already in place. In the 1976 MDP it states:

This policy of keeping natural drainage areas (channels, ponds) in their natural state (that is, not allowing any cutting, infilling or construction) must be

continued and rigidly enforced. This has been, and will always be, the cheapest, most reliable, least troublesome, and the only ‘visible’ way of handling drainage - nature’s way.<sup>20</sup>

Along with this, Town Council also introduced by-laws making sure that all existing underground storm drainage installations were not blocked inadvertently.<sup>21</sup> This environmental sensibility is impressive and its consequences have been beneficial. The town was able to understand the importance of the environment and was able to harness it in a positive way. This not only helped mitigate the worst potential effects of future flooding, but it was also a cost effective way by fixing the problem in the short term.

In 1980 the construction of the brand new state-of-the-art sewage treatment plant provided the town with the opportunity to reorganize their sewage and storm sewers as well. The 1980 MDP states under policy F-2 that “it shall be the intent of council to separate existing combination storm and sanitary sewer lines whenever possible.”<sup>22</sup> Notice that this is different from earlier policies that only called for such separations in new development zones. With this 1980 policy, the town had begun to try to fix the problems inherited from the past. The issue at hand was that the cost of changing all of the pipes would be extremely high. To change the sewers it would result the town being forced to dig up the lawns of the homeowners which would be a great inconvenience to the home owner. Greg Kehoe explained that, this was one of the major dilemmas the town had in trying to redo the town’s infrastructure.<sup>23</sup>

In 1990, new planning strategies were introduced that dramatically advanced the town’s sewer-line policies. Unequivocally it was agreed that the systems required separation urgently. This time the stance was not limited by the caveat “whenever possible”.<sup>24</sup> The town was going to try to fix its mistakes by separating the sewers in new and in previously developed areas in Kentville. However the new policy could not address the cost issue associated with older developments, although from 1990 onwards all new developments in the town, unless extraordinary circumstances intervened, are required to be serviced by separate storm and municipal sewage lines.

In an effective cost cutting move the town council in the 1994 MDP decided that it was necessary for the town to maintain the natural drainage.<sup>25</sup> On the basis of earlier decisions it was clear that the employment of natural drainage was the most effective way to solve flooding problems and therefore to keep taxes down. MDP policies ruled that all slopes above 25% must be left untouched because of the effect the gullies have on flood relief and prevention.<sup>26</sup> They listed these areas as environmentally sensitive. The move was undertaken specifically to protect the gullies associated with Chester and Canaan Avenues.<sup>27</sup>

Finally in 2001 the town council enacted another bylaw pertaining to sewer systems. Under Policy R-23 developers were mandated to ensure that all new housing developments must be built within a close proximity to existing storm sewers, or if such systems are not close by, then new storm sewer systems must be built.<sup>28</sup> This was important because it showed that the town did want to continue to advance in its collection system and prevent the chances of further flooding.

The advances Kentville has made over the last 40 plus years have been slow, but they have also been steady. They have put ideas into place as seen with the separation policy in 1961 but as the MDPs indicate, and town directors stated to us, the costs of fully solving the storm sewer systems' problems are too much for the town to bear at present. The town has in the past demonstrated considerable agility, in deciding to use natural topography to maximise natural runoff and minimize the impact on the built sewer system, for example. We believe that further attention to this strategy may bring advantages to the town at a relatively low cost.

### Conclusion

In conclusion, our research suggests strongly that storm and surface water management has been an issue for Kentville for at least the last half-century. Over this period the town has been exceptionally prone to spring flooding events, a fact recognized by the continued reference to the problem in the town's various municipal planning strategies drafted since the 1950s. Being built on a floodplain, Kentville has been susceptible to flooding, especially when there is development and construction in the town's lower elevations. What planners will need to take into account in the future is that when you build on a floodplain, you are taking away natural water absorption capacities. When you do that, you have to make a system that will help the area drain the storm and surface water so that developed areas do not flood. For Kentville to be successful at managing storm and surface water issues overall, however, something needs to be done in order to deal with the situation in the West Main area. If nothing is done to that area flooding will happen again and again. People should not be allowed to live in that area unless the sewer and storm water systems are separated.

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<sup>1</sup> Greg Kehoe, *Interview*: October 27, 2009.

<sup>2</sup> *Ibid.*

<sup>3</sup> Town of Kentville. *Town of Kentville Municipal Planning Strategy* (1980), 55.

<sup>4</sup> Hal Henderson, *Interview*: October 27, 2009.

<sup>5</sup> *Ibid.*

<sup>6</sup> *Planning Strategy 1980*, 55.

<sup>7</sup> CBC, "Group names Canada's most-threatened rivers"

<http://www.cbc.ca/health/story/2002/06/17/rivers020617.html> (accessed November 23, 2009).

<sup>8</sup> *Planning Strategy 1980*, 56.

<sup>9</sup> *Planning Strategy 1980*, 56.

<sup>10</sup> Town of Kentville. *Town of Kentville Municipal Planning Strategy* (1976), 32.

<sup>11</sup> Hal Henderson, *Interview*: October 27, 2009.

<sup>12</sup> *Ibid.*

<sup>13</sup> Bev Gentleman, *Interview*: October 27, 2009.

<sup>14</sup> Hal Henderson, *Interview*: October 27, 2009.

<sup>15</sup> Bev Gentleman, *Interview*: October 27, 2009.

<sup>16</sup> Town of Kentville, *Town of Kentville Municipal Planning Strategy* (1976) 32.

<sup>17</sup> Town of Kentville, *Town of Kentville Municipal Planning Strategy* (1963), 16.

<sup>18</sup> *Planning Strategy* (1963), 16.

<sup>19</sup> *Planning Strategy* (1976), 32.

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<sup>22</sup> *Planning Strategy* (1980), 56.

<sup>23</sup> Greg Kehoe, *Interview*: October 27, 2009.

<sup>24</sup> *Planning Strategy* (1980), 56.

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<sup>25</sup> Town of Kentville. *Town of Kentville Municipal Planning Strategy* (1994), 140.

<sup>26</sup> *Planning Strategy* (1994), 140.

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## Chapter 3: Traffic and Transport

### – *Ben Palmer and David Rice*

#### Introduction

The placement and planning of a town and its system of roads takes generations and is subject to various banalities which become responsible for shaping its development. From its incorporation in 1886<sup>1</sup> the layout of the Town of Kentville has been constantly altered in an attempt to optimize travel through and around the Town. The advent of rail and automotive transport prompted a move away from gravel and dirt roads to a more stable and durable system of paved roads. Eventually curbs, streetlights, proper signage, speed limits, large amounts of public parking and multiple routes to and from the Town were added. Accomplishing all of this took a diligent Town Council and many hours of planning and studying traffic flows and usage patterns. The influence of mundane unplanned coincidence was done away with, and gave way to serious and careful consideration behind every infrastructural decision. As the decades sped on multiple levels of government became increasingly involved in changes and additions that affected movement around the Town. Rail came and went from Kentville and left little more than a dusty imprint which was paved over in a matter of years. Filling the railway's role meant the construction of highways, some of which evolved from existing roads and others which were planned and constructed over a number of years. An intense focus on maintaining the flow of consumer traffic to and from the town grew as the Town grew, leaving little room for error in planning.

#### History of Transport in the Region

Any discussion of changing transportation patterns in the Town of Kentville necessarily should start with a brief outline of how the very nature of transport has changed in the years since Europeans first permanently inhabited the Valley.

When the first English settlers arrived in Nova Scotia there were no roads, at least in the classical sense of the term. Most travel was accomplished on foot, along trails that had been blazed by Acadians or previous Aboriginal populations inhabiting the area.<sup>2</sup> In 1760 not long after the expulsion of the Acadians, Governor Lawrence recommended that a proper stagecoach road should be built linking the growing communities of the Minas Basin, including Kentville and Windsor with Halifax. The major impetus behind this venture appears to have been economic.<sup>3</sup>

Nevertheless the journey from Halifax through the southern end of the Annapolis Valley remained a long and arduous one, with the necessity of a portage to pass from Horton to Annapolis, which would entail the crossing of the Avon and Gaspereau Rivers.<sup>4</sup> The different requirements for the building of roads in Britain and in North America were not well understood, leading to numerous failures of bridges and carriageways. In addition, the British remained preoccupied with European concerns as well as the American Revolution, so that funds for improving the highways and byways of a minor provincial territory were not forthcoming.<sup>5</sup> Prior to 1800 horse- or ox-drawn carriages were not common in Nova Scotia. Travel by horseback remained the

safest and most reliable form of transport until the advent and widespread use of the two-wheeled gig and four-wheeled wagon around 1820.<sup>6</sup>

The settlement at what was then known as Horton Corner<sup>7</sup> grew and flourished in large part due to its strategic location. There was a large sand bar on the Cornwallis River that allowed for easy fording and the eventual construction of a bridge. This sand bar was removed in 1890, but it had ‘served its purpose’, at least in a practical and economic sense. However this is the first local concrete evidence of the impact that humans and industrialisation had on the environment in the name of “progress”. Certainly flagrant disregard for the river and its fragile ecosystem has continued until very recent times. In 1829 a stagecoach line opened between Halifax and Annapolis in two sections. The journey was completed in two days with Kentville serving as the intermediate stopover point. Largely because of this strategic location on the main artery serving the Annapolis-Halifax corridor, Kentville had become the commercial centre of Kings County by 1860.<sup>8</sup> Improvements to the highway system remained sporadic at least until the beginning of the 20<sup>th</sup> century. Nova Scotia was still firmly entrenched in the Age of Sail with seaborne transport maintaining its position as the preeminent means of travel. By the middle of the 19<sup>th</sup> century this was beginning to change with the advent of steam power, coupled with the construction of the first railway lines in the province. Naturally the citizens of Kentville were eager to have rail service to their community, and they were certainly aware of the economic development and growth that this would encourage. By 1867 arrangements were finalized to extend the existing Windsor to Halifax line as far as Annapolis Royal. The rail line between Annapolis and Grand Pre officially opened on the 19<sup>th</sup> of August 1869, although there was a delay in completing a rail crossing from Horton to Windsor because of the need for an adequate rail bridge.<sup>9</sup>

As mentioned previously, road transportation received relatively little attention prior to the introduction of the motor car. The first automobiles made an appearance in 1892, although by 1904 there were scarcely 15 cars in the entire province of Nova Scotia.<sup>10</sup> Curiously, and perhaps intriguingly for local residents, the first cars built entirely in Canada were completed by a pair of enterprising businessmen from Kentville, Jack and Dan McKay. By 1910 the McKay’s, together with Archie Pelton, were in the business of manufacturing up to 25 cars annually, pieced together from borrowed Detroit parts, for resale in the Province.<sup>11</sup> Undoubtedly this would have stirred interest among the local populace in the new and exciting motorized carriage. By 1900, the Age of Sail was fading toward obscurity but the Iron Horse was still going strong. As long as this remained the status quo, progress and growth of “personal motorized” travel was minimal.

As was often the case, the First World War changed the situation dramatically. In 1918, there were only 1435 cars in Nova Scotia; within five years, this number had increased fivefold.<sup>12</sup> This dramatic increase necessitated a greater emphasis on upgrading and maintaining the highway system. In 1908 Nova Scotia had a somewhat astonishing 28 000 km of gravel roads, however as late as 1933 only a paltry 36 km of that total was paved. By 1940 this number had jumped to over 1600 km.<sup>13</sup> Most of the Provincial Highway system, and by extension Main Street and Cornwallis Street in Kentville, were paved at this time. Consequently, for the town of Kentville this was a

time of great prosperity and the apple industry served as the economic backbone of the region. A fully functional DAR and a somewhat mature system of highways throughout the province more than adequately served the Town. By the 1950s the ascendancy of the automobile, the advent of long haul trucking, and deteriorating railway infrastructure all spelled the end for the railway in the Annapolis Valley. The first train to enter the Valley from Halifax did so in 1858, and the last pulled out of station in Kentville on September 16, 1993.<sup>14</sup> With the final termination of DAR service to the Valley, Kentville entered what might be called the modern era of its transportation history.

### Transport in the Modern Era

The modern era of transportation in and around the town of Kentville is inseparable from two important developments. The end of rail service is discussed elsewhere in this report. The other development, also discussed later, was the building of the 101 Provincial Highway to the south of the town in 1971.<sup>15</sup> The actual impact of the 101 on traffic patterns is analyzed at length in this chapter. However, an important secondary development merits our attention here. This was the modification of the town's downtown core to a system of one-way traffic. This one-way system has remained largely unchanged since its inception. Any one-way traffic layout operates with north-southbound and east-westbound street pairs operating in tandem. With that in mind, at least until the year 2000 the system operated in the following manner. Main Street eastbound from Webster Street to Cornwallis Street, Webster Street westbound from Cornwallis Street to Main Street, and Cornwallis Street northbound from Main Street to the Cornwallis River coupled with Aberdeen Street southbound from Cornwallis Street to Main Street. To operate effectively, this tandem system must provide for equal flow and capacity of traffic in all directions.<sup>16</sup> Most of the intersections in the town work well, the transition between Aberdeen and Cornwallis at the north end of town is natural and removes the need for traffic signals. Likewise there are few conflicts at the southern intersection of Aberdeen and Main Street, where there is a traffic light controlled 3-way intersection. The ability to turn left on a red light when northbound on Aberdeen further alleviates traffic congestion. Since the inception of the system and continuing to the present day, the major area of concern has been the intersection of Main Street eastbound, Main Street westbound from New Minas and Cornwallis Street southbound. Traffic is required to merge onto Cornwallis Street from the two sources in a very short span of 125 metres before choosing to continue southward, or turning left on to Webster Street. Further exacerbating this problem is the somewhat confusing lane system that is in place at the intersection of Cornwallis and Webster. Motorists have the choice of travelling straight or turning left in the outside lane. The inside lane is devoted to turning left, but there is some danger of confusion leading to a left turning car in the outside lane colliding with a car which unknowingly proceeds straight on the inside lane. Despite widespread public opinion to the contrary, with the exception of this one component, the one-way system has served Kentville well since its introduction. With that said, there have been many proposed and completed improvements to the system in the four decades since its implementation.

In order to make the system function more efficiently it was determined that a twofold solution would be most effective: the reduction of traffic coupled with a

simultaneous increase in traffic capacity. As early as 1975, the possibility of a second bridge traversing the Cornwallis River was discussed. Two possibilities for the location of this infrastructure were suggested as a connection from Belcher Street to Route 1 in New Minas, or an extension of Route 12 (Chester Avenue) through to Belcher Street.<sup>17</sup> Ultimately, this project was completed, with the eventual chosen site being an extension of the 101-access highway at the western end of New Minas. The goal of this undertaking was to reduce westbound through traffic significantly during peak periods. Various compromises have also been suggested regarding reversion or partial reversion to a two-way system of traffic in the town's downtown core. The alternatives in their most basic form are removal of the north-south pairing, the removal of the east-west pairing or the removal of both pairings, reversion to a true two-way system, and finally the addition or extension of roadways to ease the flow of traffic. The first option is not viable because extra traffic signals would have to be installed, changes in lane designation would have to be made, and the flow of traffic on these two roadways is excellent in its current form. The second option is more attractive. By allowing traffic to flow east and west in the town, travel distances could be greatly reduced. As well, the bottleneck between Main Street and Cornwallis would be reduced dramatically, as only local traffic would require this route. The proposal to reinstitute a true two-way system in the town is expensive, time consuming and is probably not necessary given existing traffic volume.

One other possibility, broached as early as 1977, calls for the extension of existing roads or the creation of new ones. The initial proposals, including the extension of Webster Court eastward to Leverett Avenue have long fallen into disfavour. However, the spirit and intent of the approach survived until more feasible options were available. Ironically the disappearance of the DAR after 1993 allowed such an option to present itself to the Town. The removal of the tracks and subsequent demolition of much of the train station allowed for the construction of Station Lane, which serves as a two-way auxiliary bypass of the larger Main-Cornwallis-Aberdeen complex. This in effect allowed for a partial return to a two-way system of convenience without significantly altering the flow of traffic. In addition, Justice Way was built recently as an extension of Station Lane one block northeast of Webster Court, and subsequently connected to Webster Court on the east end in a two way fashion.

This layout would seem to allow a bypass to be built from westbound Main Street to Cornwallis Street northbound, on the east side of the Cornwallis Inn. Some locals may be aware that this is already possible via the parking lot of the Inn. Upon discussion and further review, we would suggest that this would not be a productive course of action. Installation of such a bypass would mean the placement of traffic lights at the resulting 3-way intersection. This would result in a return to the situation of the 1970s, with the bottleneck simply occurring further north on Cornwallis. In essence then, the installation of any control mechanism which halts flow in the north-south direction is detrimental to efficient movement of traffic in the town. Thus, the system as it stands works as effectively as or better than any of the potential alternatives. The only caveat is that the system can be somewhat confusing for first time or infrequent visitors to the town; this is especially true for tourist traffic. Improved signage and directional arrows throughout the town could ameliorate this.

## Congestion and its Solutions

Before 1971 (and after as well) traffic in the Kentville area had been slow moving during peak hours, and backups were reported within the Town of up to a mile during rush hour. The issue seemed to have been stemming from the Cornwallis and Webster Street intersections, and then continuing to line up in a westerly direction on Main Street, towards Coldbrook. One of the promises of the 101 was to divert some traffic away from the Town with a focus on heavy truck traffic. After the Highway 101's construction in 1971<sup>18</sup> however, the issue persisted. One report noted that it was not uncommon to see "a buildup of traffic to the east along Main Street started about 4:00 and extended for more than a mile from Cornwallis Street by about 5:00pm".<sup>19</sup> It can be seen from this that problems with the circulation of traffic within the Town were not solved by the addition of the 101 Highway alone. From 1971 onward multiple suggestions for solving the issue were put forth, by far the two most common were the building of a connecting causeway or bridge between the easterly end of Belcher Street and the westerly end of the New Minas portion of the Highway 1 (colloquially called the New Minas Ramp), and the addition of an exit or interchange at the meeting of Trunk 12 (the Chester Highway) and the 101 Highway. Traffic within the Town was just that, within the Town and relegated to flow through it before either of these interchanges was built, but people who desired to go to Coldbrook or New Minas and bypass Kentville were easily able to do so. However, those who were already in the Town were forced to use Highway 1 and thus contributed to the aforementioned bottleneck. Actually completing the two projects was easier said than done in the literal sense as over a ten-year period, both were suggested, but neither were completed or even advanced in terms of their planning. Multiple reports from 1975 through to 1982 suggested and explained the aforementioned additions, but again yielded no results. Finally by 1988 both projects had been completed in their entirety<sup>20</sup> and a significant difference in the flow of traffic in and out of the Town had been achieved. A study commissioned by the Department of Transportation of Nova Scotia indicated that the addition of the 'New Minas Ramp' alone would remove four thousand vehicles per day from the downtown core.<sup>21</sup>

Ultimately, these revisions and additions did provide net relief for the traffic flowing into the Town, although the 101 interchange at Trunk 12 was less effective at removing traffic. This interchange provided a route which when approaching from the east on the 101, was a faster way to access the downtown. Both of these also serve to demonstrate that another of the recommendations from the J. Phillip Vaughan and Associates report was evaluated and carried out not only by the Town Council, but also by the Provincial and Federal Governments.

The effect traffic has on the Town of Kentville is reducible to several factors which play a role in its general flow. One integral factor is parking. The town is spread out over a large geographical area. Because of this, its roads have developed in the same manner. Although the central section of the Town (Centre Square) is fairly compact in extent, much of the Town's shopping and services are spread well beyond that area. At present, the largest area of public parking nearest the center of the Town is in Centre Square. However, this area often overflows before midday and later arrivals to the downtown core are relegated to finding spots further out. Main Street (a section of Highway 1 which becomes Main Street upon entering the Town's limits) is presently

equipped with parking on both sides of the two lane street from the junction with Webster Street at the western end of the Town. A recently completed project led to the addition of parking on the South side of Main from the Webster Street interchange to the intersection at Cornwallis Street. This parking modification was commissioned and completed within the last several years. Presently, the next most-used parking in the Town is the block of streets formed around the Town square by Aberdeen, Main, Cornwallis and Webster streets. These streets all feature parking on both curbs, with all of the parking facing in the direction of the streets' one way traffic. A study of parking by the Lawrencetown Survey Institute provided information on parking in the Town in 1980.<sup>22</sup> Within the Centre Square area, South of Main Street and North of Webster Street this report tabulated 873 spaces divided between "short term" and "long term". The institute's report used a mixture of two standards to find the desired number of spaces that should exist within the downtown core using the following standards:

[P]rovide one parking space for each 600ft<sup>2</sup> of floor area. This... revealed an excess of 117 short-term spaces and 659 long term spaces in... downtown.... The second set of zoning standards... called for businesses to provide one parking space per 300ft<sup>2</sup> of floor area. This analysis indentified that there was a deficiency of 393 short term parking spaces and an excess of 94 long term stalls in the entire downtown area. This is a high standard of parking availability to provide in a downtown area but was adopted by the Town of Kentville.

These standards created a strict set of criteria by which the Town further developed parking from the 1980's. However since then no significant additions to the total number of available spaces in the town have been made, nor have the strict standards used to evaluate the number of spaces changed. While the downtown core area contains a great deal of the shopping, it does not provide the needed spaces for businesses being built outside the downtown core area. "The... availability of parking spaces in the down-town area is not a satisfactory method of evaluating parking... 'Walking distance' must be considered."<sup>23</sup> As "walking distance" becomes greater, this issue will require much greater consideration.

Traditionally, parking in the downtown core has not received the attention it deserved. In 1977, however, an external consultant was contracted to analyze the situation. The resulting report by J. Phillip Vaughan and Associates tabulated the total number of spaces not only in the core area, but outside of it as well. The spaces enumerated in the Vaughan and Associates report are public and private spaces, which accounted for 822 short-term spaces and 1,353 long-term spaces.<sup>24</sup> Although this was written earlier than the Underwood McLellan Report the Town still chose the more stringent of the two standards available at the time, which was "3 spaces per 1,000 square feet of office area or, similarly, 1 space per 333 square feet of area."<sup>25</sup> Based on this standard the total number of spaces that should be available in the Town is 2,329.<sup>26</sup> Using these calculations, and this tabulation of the number of spaces which existed (which has not changed substantially aside from the aforementioned addition along the southerly side of Main Street), there was a shortage of 174 spaces. With the continuing population growth of Kentville and the Valley, the need for the amelioration of this shortage was apparent. The Vaughan report did propose a number of solutions, the

foremost of which was the survey and construction of a parking structure within the Town.<sup>27</sup> “It has been suggested that a solution to Kentville’s perceived parking problems might take the form of a covered parking structure.”<sup>28</sup> Public opinion seemed to indicate that either privately or publicly, the construction of the parking project would not only serve to resolve congestion but it could also generate some profit for the Town or any private entity that chose to pursue it. In 1977, it was expected that land within the Town could have been procured for roughly five to ten dollars per square foot<sup>29</sup> making a medium-sized structure the most economically viable at approximately five hundred dollars per space for a six level structure.

The Town does currently police most of its current spaces via foot patrol, which applies tickets as a penalty to motorists who pass the two hour time limit (signs which warn of this can be seen almost everywhere in the downtown core) however with the addition of the parking structure the revenue from parking in the Town would increase significantly. Offsetting this would be the annual cost of maintenance and staff for a parking structure, which varies between the sizes mentioned in the 1977 Vaughan report. For a four hundred-car structure, the costs would have been roughly ninety three thousand dollars, and for a six hundred car structure one hundred and twelve thousand dollars per annum. As the report states, this assumes the Town would provide a property tax rebate for the structure.<sup>30</sup> For the recommended five hundred-car structure, the Town would have to have committed one hundred and three thousand dollars per year to maintain and staff the building. The Vaughan report of 1977 and the Underwood McLellan report of 1981 both produced multiple recommendations for improving the Town’s ‘perceived parking problem’. The Town should provide free long-term parking for business owners or employees when the need for extra space becomes apparent, and the suggested area for this expansion was the D.A.R. land nearest Webster Street. It was recommended that the Centre Square lot be re-designated as short term parking area. It later was, and now carries a two-hour limit. The third recommendation carries one of the most timely suggestions within the report “it is recommended that parking meters be placed on all on-street locations surrounding the center and north squares.”<sup>31</sup> The report suggests that this is not something that should be implemented as a means to produce revenue for the town, but rather to keep parking available and enforce time limits. The Underwood McLellan report further indicates that the Town should continue to ‘obtain land’ in an effort to be further prepared for parking expansion when the need arises.<sup>32</sup> Ultimately, after considering the costs of the proposed parking structure the Vaughan report concluded that the construction, maintenance and staffing of such a massive structure could not be reasonably undertaken, and although the suggestion for the implementation of such a building had come directly from the Town council, Vaughan and Associates recommended that this not be considered.<sup>33</sup> Most of the recommendations in the Vaughan and McLellan reports were instituted in one form or another and nearly all of them were necessary or soon to become necessary within subsequent decades. Unfortunately a large number of complaints were received prior to and after the two aforementioned reports. Even into the mid 1990’s parking was still an issue that generated complaints from the townspeople to the Council.<sup>34</sup> By this time additional bodies monitored parking availability within Kentville, in conjunction with the Town council. A joint committee of the Town Council, Kentville Development Corporation

Ltd. and staff of the town were involved in monitoring “availability, allocation, regulation, servicing and policing.”<sup>35</sup>

By 1994 with the completion and implementation for most of the recommendations from the Vaughan report, the Council determined that there was no real problem in terms of the number of spaces but rather a problem with the usage of the existing spaces. Issues with congestion in Kentville after the implementation of the one-way traffic system were minimal but not non-existent; the Council did still receive a large number of complaints, and in the 1994 *Community and Economic Development Plan* parking was ranked as number seven of seventeen issues which were facing the community at the time.<sup>36</sup> Parking was chosen as number seven not based on whether or not parking was really at the heart of the issue but solely on the number of complaints received concerning the issue.

Today the layout of the Town is nearly identical to that of 1994. The traffic volume through the Town does not face any major impediments and most times during the day can be seen to flow freely through even the downtown core. The major problem that confronts the Town is the lack of future space in which to expand parking. All of the major possibilities for expansion mentioned in planning reports have thus far been used by the Town or by private industry. As expansion continues ‘walking distance’ into the Town is going to mean something drastically different from what it had at the time of the 1977/1981 reports, and different even from the 1994 report. Ultimately, all of the many recommendations made in the reports that have been covered can be distilled down to two major ones, both of which have gone essentially unfulfilled. Implementing paid parking within the town *will* assist in controlling the use of the parking spaces in and around the downtown core and that will become increasingly important as the spaces become that much more difficult for the traveling public (and most importantly the traveling consumer) to procure. The final recommendation (which seems most important to start early on), is the purchase of land to be used as parking lot as close to the Town’s centre as possible. The Town Council has remained extremely vigilant in ensuring that the parking facilities in the town are held to a very high standard and have accomplished this through the continual study and review of the Town’s layout, traffic flow, and population, as well as the number of commercial retailers within the Town (in the core or in the Town’s environs). Proper use and implementation of the information that came from these reports has led to parking being essentially a non-issue at present. Certainly though, without continuing to monitor the availability of parking in the Town, the situation could get quickly out of hand.

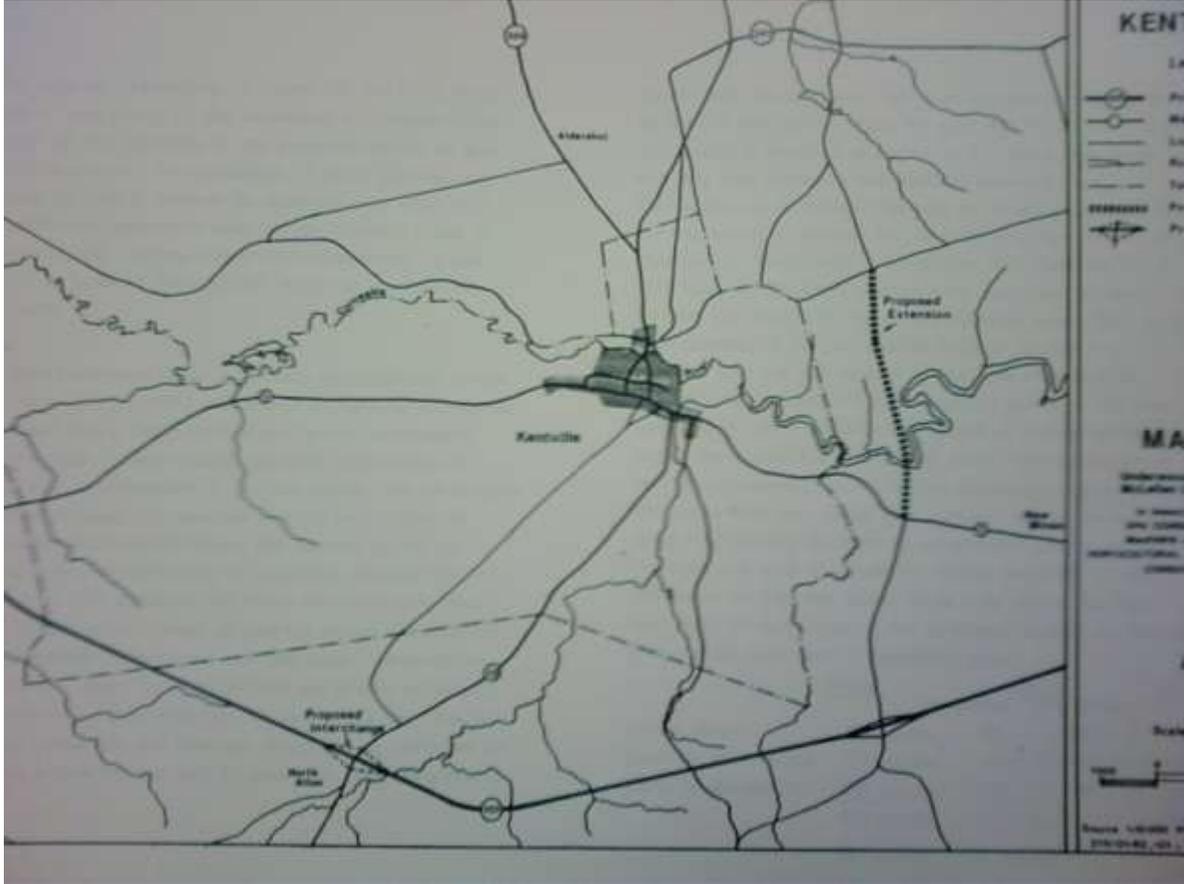
### Conclusions

At first glance, transportation appears to have a negligible impact on the environment of a specific area in which it develops. One can argue that the infrastructure involved or the construction of it can have a detrimental and long lasting impact on the immediate environment. For example the construction of Highway 101, or prior to it the old routes through the Valley and the DAR changed the face of the surroundings. In addition, they almost certainly changed patterns of groundwater flow, as well as altering habitats for flora and fauna. However in comparison to the impact of other environmental factors, such as natural disasters, the pollution of the Cornwallis River, or dumping and waste

disposal, the effects seem negligible. In actuality, the changing face of transportation strongly affects these other important environmental factors. Ease and efficiency of transportation determine where a town or city is going to be built, and how it is going to be planned and expanded in the future. In the case of Kentville, the town grew along a point in the river that allowed for easy crossing, as well as easy access to the sea when shipping was still prevalent. In addition, the railway was built along the same route, which allowed for the continued growth of the Town. This in turn determined population patterns for the town, and by extension the growth and specialization of industry. It is understood that the environmental impact, as well as environmental factors contributing to this development were significant.

The converse is also true. Changing economic and environmental realities, not the least of which was the impact and cost of fuel consumption, led to the eventual elimination of rail service to the Valley. This development necessitated the construction of Highway 101, which again dramatically altered the industrial and commercial profile as well as the environmental footprint of the Town. It also led directly to the institution of the one-way system of traffic through the Town. This much-maligned system has worked quite well, although it can be argued that it has somewhat limited the commercial viability of ventures within the immediate community. In addition, parking and land use within the town, including the development of Centre Square into a modified “marketplace” play a role in this. A delicate balance must be struck between having enough green space, adequate room for industry, commercial development, residential space, and finally “auxiliary” services. Transportation is truly the tie that binds all of these disparate factors together, and an effective system of transportation is a must for a successful community to achieve this balance.

*Appendix: Proposed Connector Between Highway 101 and Belcher Street*



<sup>1</sup> Mabel G. Ferguson & Marion Schurman McLellan, *A History and Geography of Kings County*, Kentville Schools, 1967, p. 30

<sup>2</sup> James Doyle Davison, *Mud Creek: The Story of the Town of Wolfville, Nova Scotia*. Wolfville N.S.: Wolfville Historical Society, 1985, 40.

<sup>3</sup> *Mud Creek*, 40.

<sup>4</sup> *Mud Creek*, 41.

<sup>5</sup> *Mud Creek*, 41.

<sup>6</sup> *History of Kentville*, 2

<sup>7</sup> *A History and Geography of Kings County*, 30

<sup>8</sup> *History of Kentville*, 3

<sup>9</sup> *History of Kentville*, 4

<sup>10</sup> [www.rootsweb.com/~pictou/hiwaysg.htm](http://www.rootsweb.com/~pictou/hiwaysg.htm) [Online Resource]

<sup>11</sup> William H. McCurdy, *The McKay Motor Car: Nova Scotia's First Production Car*. Halifax N.S.: Petheric Press, 1968, 3

<sup>12</sup> Mike Parker, *Historic Annapolis Valley: Rural Life Remembered*. Halifax N.S.: Nimbus, 2006, 40.

<sup>13</sup> *Historic Annapolis Valley*, 40

<sup>14</sup> *Historic Annapolis Valley*, 36

<sup>15</sup> *Parking and Development Kentville, NS* prepared by: J. Phillip Vaughan and Associates Limited in association with de Leuw Cather Canada Limited and Development Planning Associates Limited.

<sup>16</sup> *Ibid*, 3

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- <sup>17</sup> *Parking and Development Kentville, NS*, 4.  
<sup>18</sup> *Parking and Development Kentville, NS*, 2.  
<sup>19</sup> *Parking and Development Kentville, NS*, 1.  
<sup>20</sup> Community Economic Development Plan, Kentville Community Economic Development Committee, June, 1994.  
<sup>21</sup> Underwood McLellan, Ltd. *Downtown Kentville Development Plan*. July 1981, p. 38.  
<sup>22</sup> *Downtown Kentville Development Plan*, p. 40.  
<sup>23</sup> *Downtown Kentville Development Plan*, p. 40  
<sup>24</sup> *Parking and Development Kentville, NS*, p. 5  
<sup>25</sup> Ibid, p. 1  
<sup>26</sup> Ibid, p. 5  
<sup>27</sup> Ibid, p. 6  
<sup>28</sup> Ibid, p. 6  
<sup>29</sup> Ibid, p. 7  
<sup>30</sup> Ibid, p. 8  
<sup>31</sup> Ibid, p. 10  
<sup>32</sup> *Downtown Kentville Development Plan*, p. 42  
<sup>33</sup> *Parking and Development Kentville, NS*, p. 11  
<sup>34</sup> Community and Economic Development Plan, Town of Kentville Community and Economic Development Committee, June, 1994, p. 18  
<sup>35</sup> Ibid, p. 18  
<sup>36</sup> Community and Economic Development Plan, Town of Kentville Community and Economic Development Committee, June, 1994, p. 19

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[www.rootsweb.com/~pictou/hiwaysg.htm](http://www.rootsweb.com/~pictou/hiwaysg.htm)

# Chapter 4: Abandoned Industrial Sites in the Town of Kentville

## – *Andrew Williams and Brock McDougall*

*“Kings County has had a few small manufacturing interests but none of them have ever had great importance or have yielded their projectors much profit; the country is not manufacturing country”*

- Arthur Wentworth Hamilton Eaton in *The History of Kings County*

### Introduction

While Kentville may not be known for its industrial production, it has a history of industrial operations that dates back to the 18<sup>th</sup> century. As an integral part of the Annapolis Valley apple industry, Kentville became a hub for export and secondary industry. Light and medium industry has been facilitating the needs of primary producers consistently for 100 years and there is a need to establish whether or not these activities have implications for the local environment. In doing so, it will be easier to understand what can or should be done in respect to any possible industrial locations. We were asked to research any abandoned industrial sites in Kentville and come to some conclusions on what these sites may mean for the town; most importantly, understand any environmental threats they pose. As it stands today, there are no areas in Kentville that can be considered abandoned industrial sites. All former industrial locations have been destroyed, demolished, or redeveloped. Therefore, abandoned industrial sites do not represent a significant part of Kentville’s current organization; so they do not pose any significant environmental threat that we were able to uncover. To understand why there are no abandoned industrial sites in Kentville, we will detail the history of the major industrial operators in town. We split Kentville’s history into three sections in rough accordance with the patterns of development experienced in the last two centuries. These sections are: the early period from the town’s creation until World War Two, the middle period from the 1940s to the early 1970s, and the latter period which covers from the late 1970s to the current day.

### Research Method

Our research required both archival digging and physically seeking out industrial sites within the town. In addition, we have gleaned a wealth of information from correspondence with the town’s local historians. Fundamental to the archival aspect of our research were the collections of the King’s County Museum and Acadia’s Kirkconnell Room. Through documents found in archives and various secondary sources we were able to put together what industry had existed in Kentville. The industries which we have chosen to highlight, we believe, are the best exemplars of Kentville’s industrial past and in some cases lead right into the present. It is likely that these sites would have environmental implications for the town if they still stood today and it is therefore significant to see that they have been removed as potential threats. Also worth mentioning is the lack of interest found in any documents relating to industry about negative effects on the environment. Generally speaking, any record kept of Kentville’s industrial past was void of environmental information, except possibly anecdotal comments. It is a recent phenomenon then, that the Town of Kentville is showing an interest on how its actions may affect its environment. The 2001 Municipal Planning Strategy was the first major document that we recovered that included an explicit expression of concern for the

environmental consequences of development. In addition, the introduction of a number of interesting by-laws shows the town's recent attempts to regulate the environmental impact of its activities.

The original town legislation on abandoned industrial buildings was a by-law called *Dangerous and Unsightly Premises*. This by-law was significantly flawed as it failed to define what "unsightly" meant and who was responsible for both enforcement of the by-law and what transgression penalties were. The by-law was repealed in October 2007 in favour of adopting the much more comprehensive Nova Scotia Municipal Government Act.<sup>1</sup> The MGA is province-wide legislation that clearly defines the role of each municipality on the subject and also sets fines and penalties should infractions occur. As one government employee put it, the MGA has "more teeth" in comparison to the old by-law.<sup>2</sup> If abandoned industrial sites were ever an issue for the Town of Kentville then the original by-law might have been utilized but we were unable to find any mention of such occurrences. This furthers the notion that abandoned industrial sites are not an issue for the town. Any potential sites that may have been dangerous would have fallen under this by-law, but since these sites do not appear to exist within the town the by-law became unnecessary. An employee of the municipal office, Carol Harmes, noted that the only complaints received pertaining to a by-law on unsightly premises were about private residences and not industrial or commercial sites.<sup>3</sup> The MGA is currently Kentville's primary legislation concerning pollution, abandoned property, and other issues to do with dangerous and unsightly premises.

Literature regarding Kentville's industrial history is few and far between. However, there are some notable works such as William McCurdy's short history of the *McKay Car Company*, Louis Comeau's Industry section of his book *Historic Kentville*, or Anne Hill's history of the apple industry, *Valley Gold*. While Hill's work is not strictly relevant to our subject, we found that following the booms and busts of the apple industry allowed us to understand the evolution of Kentville's economy. Kentville has gone from a hub of agricultural production to a town that facilitates the needs of primary producers as well as engages in light secondary industrial production. A doctoral dissertation found in the Acadia library called "Agricultural Transformation in a Regional System: The Annapolis Valley, Nova Scotia" gives a comprehensive overview of Kentville's agricultural and industrial evolution up until 1976. This work was of great help to us in understanding the patterns of development that have taken place in Kentville and the Valley as a whole. Information concerning the industrial park was derived from a variety of sources: town meeting summaries, park information newsletters, and correspondence with companies within the park.

A major source of information has been newspapers such as the *Kentville Advertiser* and the *Chronicle Herald* and we owe much of our research to articles found within. We encountered a small mystery involving a gap in *Advertiser* records from 1918 to 1926, but cuttings found in the Kentville municipal archives and online were able to fill much of the gap. Our biggest challenge from a research point of view was finding information from the 1940's to late 1960's. There was either very little new industrial development undertaken in this period or contemporary writers did not find industrial events to be of any significance. Changes in the rail industry are outlined by the DAR but until the creation of the Industrial Park, very little has been written on the subject of midcentury industry in Kentville.

The internet was of limited help to our research but there are a number of websites that have been useful. *NovaNewsNow.com* has provided a few good quality general articles

concerning the roundhouse and its destruction. The “*Nova Scotia’s Electronic Attic*” website has proved to be an extensive source for primary data. This website contains thousands of digitized primary source cuttings on various aspects of Nova Scotia history. The sources are organized chronologically and are drawn from newspaper articles from all over the provinces. While the focus of the site is directed to communication and transportation, information on industry in Kentville is liberally scattered through the 208 catalogue pages.<sup>4</sup>

Local historians, residents, and town employees have been extremely helpful to our research. For example, Carol Harmes, a municipal employee, was able to help our search for appropriate by-laws pertaining to abandoned industrial sites. She was able to supply insight on the particulars of certain by-laws, specifically the now repealed *Dangerous and Unsightly Premises*. Correspondence with Courtney Burrell, the son of a former owner of the Lloyds Foundry site, proved to be one of the most comprehensive sources of information on that particular business and has therefore proven valuable. Author and historian Louis Comeau, whom we were able to contact through Bria Stokesbury at the King’s County Museum, sent us a wide range of information which served as an excellent starting point for our archival research. Correspondence with writer and historian Ed Coleman provided particular insight into the McKay Car Company and his editorial pieces from the *Advertiser* helped direct our research in regards to Kentville’s railway history. The private collection of the now-deceased Leon Barron, a transportation enthusiast and local historian, is currently being entered into digital format at the Acadia University archives. Once this material becomes more widely available, it could prove to be a greater source of knowledge on the Kentville and area history, including industrial activity.

#### The Early Industrial Period (1700-1940s)

While shipbuilding may not seem to be the most natural of industries in Kentville, two historical sources, dating from 1910 and 1930 respectively, indicate that it may have been one of Kentville’s earliest industries. Ed Coleman, in one of his *Advertiser* columns, explains that the entire Minas Basin was heavily involved in the shipbuilding industry and it is not surprising that Kentville residents tried to become a part of that. Mr. Coleman’s research suggests that the ships were constructed on the banks of the Cornwallis River, most likely near the site of the modern day Family Tire store and Town Bridge.<sup>5</sup> The two sources that tell of shipbuilding, A. W. H. Eaton’s *History of Kings County* and W. C. Milner’s *The Basin of Minas and Its Early Settlers*, mention three ships in total being built: a schooner in 1790, a 200 ton brig in 1813, and a 40 ton barque in 1846 christened *The Kent* in honour of the Duke of Kent.<sup>6,7</sup> It is hard to imagine ships setting off from the present-day Cornwallis River, but the river was much deeper and wider than its current level and that would have facilitated the construction of ships. Kingsport and Canning may have been the focus of shipbuilding in the Valley, but Kentville should be proud of its small part in the Nova Scotia shipbuilding history.

The Nova Scotia Carriage Company was one of the earliest industrial businesses to inhabit Kentville and was also one of the better known. Dating back to 1868, the company specialized in the manufacture of horse-drawn vehicles, carriages, and sleighs of all shapes and models.<sup>8</sup> The company was successful for most of its operating history and was even awarded a ‘recognition of merit’ in 1897 for the high quality production of light carriages.<sup>9</sup> The company’s production was steady for the first two decades but during the 1890s, output increased from 120 carriages in 1896 to 300 carriages in 1897. This increased production led to

the expansion of the company's facilities in 1899 and profits continued to increase into the early 1900's. It was only with the advent of the car that the NSCC's business began to falter and in 1908 the company was bought and reorganized by the McKay brothers as the Nova Scotia Carriage and Motor Car Company Limited.

The McKay Motor Car Company is one of Kentville's most famous businesses for a very simple reason: it was the first car production company in Nova Scotia. The brothers Jack and Dan McKay teamed up with Berwick-born mechanic Archie Pelton and rented the facilities of the Nova Scotia Carriage company in 1908. While carriage production continued unabated, Pelton secured enough parts for the creation of 25 automobiles<sup>10</sup> and in 1910 production began on Nova Scotia's first automobile, The Torpedo Roadster. Dan McKay and Pelton even took one of these vehicles on a 2600 mile road trip from Kentville to Regina, Saskatchewan. While the principal goal of this expedition, to set up dealerships, was never realized, the McKay brothers did attract the attention of a group of Amherst businessmen. At the time, Amherst was making a bid to become the industrial centre of Nova Scotia and the brothers were persuaded to move production to a larger facility in the town 220 miles away. The company subsequently operated until 1914 before closing down due to a lack of operating capital.

The Carriage Company's location in Kentville from 1868 to 1899 remains a mystery and one that noted local historians Ed Coleman and Larry Eaton have investigated thoroughly. The the company's 1899 facility was a four story building which was built on the modern day site of the Kings County Municipality building. McKay Motors occupied the building from 1908 until 1912 when the company moved production to Amherst. The building was subsequently purchased by a local lumber mill and used for lumber storage. Unfortunately, a fire on Christmas Eve of 1927 destroyed the building and also resulted in the death of John Byng, the building's night watchmen. If it wasn't for a fresh fall of snow, Ed Coleman notes, there would have been a real chance that most of Kentville's commercial district would have gone up in smoke with it.<sup>11</sup> The cause of the fire is currently unknown and is likely never to be known as Byng was the only known person on the premises.

Another prominent industrial business in Kentville was Lloyd's Foundry, founded in 1881 by John I. Lloyd and incorporated in 1895 as Lloyds Manufacturing Company. Located on River Street,<sup>12</sup> Lloyd's was Kentville's first dedicated foundry and machine shop and produced a wide array of industrial tools and manufacturing parts. These included gas engines, barrel making equipment, gold mining machinery, pulp machinery, belting, and saw mill outfits. By 1913, Lloyd's consisted of a machine shop, a foundry and a carpenter shop. As a facilitator of commercial and industrial production, the company was intrinsically linked to the creation of secondary industry within the town. A perfect example of this would be Lloyd's short but important relationship with the McKay Car Company. Early on in the production of the McKay automobile it was discovered that the drive shafts for the cars were all too short. Lloyd's foundry was subsequently contracted to make shafts of the appropriate dimensions and the cars were completed.<sup>13</sup> The presence of a skilled and important local foundry saved the McKay brothers the costly and time-consuming process of reordering drive shafts from their sources in the United States. While much of the foundry's early business was to local town customers and surrounding farmers, Lloyds also engaged in an extensive export business. The Bridgetown *Monitor* reported that in a single week in 1895, Lloyds exported \$1000 worth of machinery to different parts of the province and expanded their operations from seven employees to fourteen. From 1881 to its closure in 1987, Lloyds exported machine parts and

industrial components to many Nova Scotia communities as well as to other Canadian locations in New Brunswick, Quebec, Vancouver, and Newfoundland.<sup>14</sup>

Fire has played an important part in the history of Lloyd's foundry with at least 3 major fires since its inception. The first two fires were in 1890 and 1900 and both caused extensive damages to both the structure and equipment. In 1935 the foundry was purchased by Winslow J. Burrell and became the Burrell Foundry and Machine Works. During World War II, the Burrell Foundry was heavily involved in the maritime war effort producing naval equipment such as racks for the storage and deployment of depth charges.<sup>15</sup> The foundry was also involved in modernization of the valley's dykes and marshlands. The Maritime Marshland Reclamation committee commissioned the Burrells to create brass sluices which were then used to replace the ones used by the original Acadians.<sup>16</sup>

It was under Burrell's ownership that the site suffered its third and worst fire in 1967 which resulted in the destruction of the foundry and damaging of the machine shop. The foundry was not subsequently rebuilt but the business continued to operate until 1987. Courtney Burrell, Winslow Burrell's son, recalls that reasons for the eventual closing of the business were linked to a decrease in business, a lack of qualified employees, and the wish to retire expressed by the Burrell family. In our conversation with Mr Burrell, he mentioned that companies that usually would have required the services of their machine shop had begun to implement their own in-house shops. They no longer required the services of a third party and therefore the Burrells business suffered. In addition, the creation of the Annapolis Valley Industrial Park was likely source of competition as much as it was business. Courtney Burrell also mentions that the family's health has been affected by their work within the foundry. Decades of exposure to industrial pollution and exhaust have left him and other members of the family with various health issues. The lack of safety and health knowledge associated with pre-contemporary industrial production is responsible for the Burrell families affected health. Modern industrial production in Kentville is subject to extensive government regulation in order to minimize the negative long term health effects.

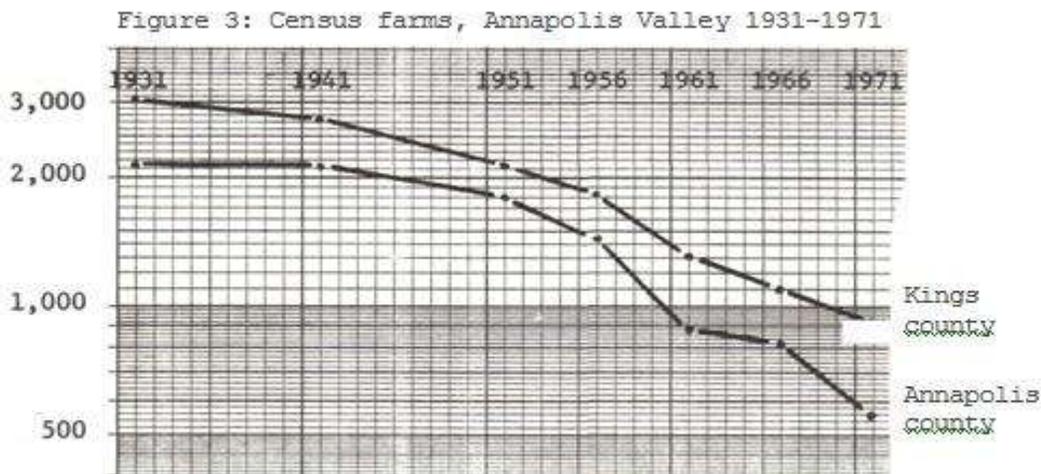
The most important industrial development in the early history of Kentville is the creation of the railway in 1869. During that year, the Windsor and Annapolis Railway linked Kentville to the growing network of railways that united Nova Scotia industry with the rest of the world. At the time, rail was the only method of engaging in a widespread export business and the moment Kentville became part of the system, the market for its goods expanded dramatically. This had an important effect on secondary industry within Kentville. J.I. Gates Cooperage, located at the foot of Gallows Hill on Cornwallis Street, was one of the few barrel makers in Kentville and its business grew as Kentville's farmers exported more produce. In 1910 the company produced half a million barrels and thanks to the growth of both the rail industry and the apple industry; annual production was increased to 1.2 million by 1925.<sup>17</sup> By the 1930's, the valley was shipping about 3 million barrels of apples to Great Britain every year.<sup>18</sup> Agriculture was completely reliant on the train industry and this massive demand is reflected on the various expansions made to the train yard in the early period. The first improvement was made in 1916 when the Dominion Atlantic Railway constructed a 5-stall roundhouse at the west end of the Kentville yard where the DAR subsidiary Cornwallis Valley Railway branched off for Kingsport.<sup>19</sup> The second expansion came in 1926 when the round house was expanded by Canadian Pacific Railways, the parent of the DAR, to include 5 extra stalls.<sup>20</sup> The railway has

played an extremely important part in the development of Kentville and we will expand on this concept in later sections.

Middle Industrial Period (1940s to the 1970s)

What we will call the middle industrial period spans from a transition period in Kentville industry following the Second World War and lasts until the beginning of the 1970s. It was at this point the town was experiencing significant changes and modernization. There was a shift from primary industry such as large scale agriculture to secondary industry, for instance services that facilitate primary industry, which coincides with a relative decline in agricultural production. Industrial changes are highlighted by the conversion that occurs in the rail systems and the planning and formation of the Kentville Industrial Park.

It is in this period where we see a major shift in Kentville’s agriculture. In the 1930s the apple industry was at its height because of the massive produce demand by the British market during winter months.<sup>21</sup> Unfortunately, lack of demand from the crippled British economy following the war resulted in a sharp decline in Valley agriculture. This is best envisioned if we look at the number of local farmers. At the end of the Second World War there were about 4000 farms in the Annapolis Valley, but by 1976 there were less than 1500.<sup>22</sup>



Source: Hugh Allison Blackmer, *Agricultural transformation in a regional system : the Annapolis Valley, Nova Scotia*. (Stanford University, 1976), 65.

Despite this decline, the Graves cannery located next to the roundhouse on West Main Street was still in operation. In 1972 a large American corporation, Stokeley-Van Camp Inc, purchased Graves Foods as well as the cannery. The absentee ownership of a local industry meant that much of its profits were no longer re-invested in the community.<sup>23</sup> This is one of the many contributing factors that have decreased the importance of the agricultural industry on the town of Kentville.

The Kentville Industrial Park was commissioned in 1969 and opened ten years later in 1979<sup>24</sup> where as we will see, it played a significant role in the contemporary period. The ten year waiting period for the opening of the park was a result of the lack of available

infrastructure at the time of its initial development.<sup>25</sup> As this industrial area is currently operating, it could be considered a fairly long-running industrial location. It was thought that an industrial park could provide potential for developing on the linkages created between various primary, secondary, and tertiary industries in the area. This idea derived from the fact that the Kentville-Wolfville corridor of the Annapolis Valley was the region's most important trade and service area, melding primary and secondary industry.<sup>26</sup> It soon became apparent, however, that development in this respect would be limited by certain factors. For instance, the Nova Scotia Community Planning Division reported in 1977 that "secondary industry [in this period] is characterized by a seasonal, low wage, and relatively large female labour force."<sup>27</sup>

The rise of highway freight trucking became a threat to train shipments during the middle period, and was a significant factor in the later the choice of highway over rail. Trucking was a becoming viable replacement for the steadily decreasing export demands.<sup>28</sup> Before the demise of the rail systems, we see in 1960 a shift from coal fired steam trains to diesel powered engines.<sup>29</sup> The fact that Canadian Pacific Railways would undertake this changeover, which would have required revamping any fuelling and maintenance systems in Kentville, indicates that the company had at least some faith in a continued rail transport system in Kentville.

#### Late Industrial Period (1970s – 2009)

The late industrial period, which we will consider to range from 1970 to the present, can be characterized by the movement of industry outside of the town centre and into the newly established industrial park. Concurrent with this process is the decline and then the eventual loss of a rail system into Kentville. As it currently stands, there are no abandoned sites within the Kentville Industrial Park. This is clearly a fully-operational area of industry for the town and will likely continue to act as such, concentrating all of Kentville's industrial activity in one area on the town's periphery. The former Dominion Atlantic rail yard is likely the only recent example of industrial abandonment. The site is currently being developed into assisted living housing as all former DAR buildings are gone.

Possibly the most discussed industrial issue of the last 20 years is the decline and eventual demise of the Kentville and regional rail network. Hints of the decline are scattered throughout the period: the choice to cut back diesel rail service by the railway in 1979,<sup>30</sup> for example. Prior to that in 1973, as part of a plan to further develop Kentville, the town sought \$7 million to relocate old DAR buildings two kilometres west of their original location. The town also sought to move the rail station 200 feet north. The reason given to keep the building, rather than demolish it, was that it was considered "a living part of Kentville Heritage".<sup>31</sup> This argument was apparently not enough for the town council because in 1990 the train station was demolished despite the apparent historical value of the site.<sup>32</sup> We think that the real sign of an end in Kentville's rail system came in 1988 when Canada Pacific Railway (at that point the owners of the track and rail yard) applied to the National Transportation Agency to abandon the first parcels of track.<sup>33</sup>

The only significant evidence surrounding old industrial sites and environmental problems comes from the former DAR roundhouse which, until 2007 when it was demolished, was the only evident abandoned industrial site in Kentville. The existence of rail facilities became unnecessary in view of the fact that the last train to depart from Kentville did so in

September of 1993 and the last usage of the roundhouse in terms of train maintenance was as far back as 1961.<sup>34</sup> At the roundhouse site, and buried below it, was a large amount of old materials such as wood, rusted metal and concrete.<sup>35</sup> The most dangerous and potentially environmental harmful finds were discarded asbestos and lead paint, materials that were commonly used in the past. The asbestos and lead were removed in July 2007<sup>36</sup> and whatever effects the substances may have had on the land or nearby water have yet to be discerned. No mention can be found on the subject of environmental damage on the site. Some have spoken positively about what was found at the roundhouse location, with the exception of the asbestos, because much of the other materials that were found were recyclable and reusable. Some artifacts of historical interest which pre-dated the 1920s were also found as well; these include two wheels from the front truck of a steam locomotive, vintage bottles, an old cigarette package, and even a tin can time capsule from 1938.<sup>37</sup> Another long term consequence of the demolition of the rail yard is negative publicity. In 2008 Kentville was included in a list of worst towns in terms of heritage preservation generated by the Heritage Canada Foundation because of the demolition of the roundhouse.<sup>38</sup>

The former Graves juice plant and cannery on West Main St. may appear to some as an abandoned industrial site. The location does not seem to get much traffic and until recently, the area surrounding the plant was quite disordered and run-down. The building is now actually used as warehouse space by Great Valley Juices to store finished product. Great Valley Juices is a division of the Quebec firm Lassonde Industries Inc. and so the site belongs to that company. All production operations ceased at this site in 2000, but the building was never at any point kept empty or abandoned according to correspondence with a company representative. As for the environmental implications of this site, the company has also stated that a class 1 environmental study was done in 2005. They concluded that there were no apparent environmental concerns in regard to the site.<sup>39</sup> The Environmental Assessment Branch of the Nova Scotia government requires new developments to undertake an environmental assessment. It is possible that such an assessment is required as the plant was developed into a storage facility which meant to warehouse liquid goods; however, it is also possible that the plant is “grandfathered” in the legislation and therefore does not trigger the criteria for such an assessment.<sup>40</sup>

Since its opening in the 1979, the Kentville Industrial Park has increased its potential for future expansion.<sup>41</sup> Land in the park is quite valuable; listed at \$35,000 per acre and any expansion of the park would possible decrease this figure.<sup>42</sup> Minutes from a recent Town Council meeting highlight a need for further discussion between the Council Administrative Officer’s (CAO’s) and Nova Scotia Business Inc. regarding an expansion of the park. There is an expressed desire on the part of NS Business Inc. to expand the park into the unoccupied land south of the park, towards the 101 highway. There is a belief that expanding an existing park would be beneficial for the town.<sup>43</sup> The 195 acre park is broken down as such: 53.4% developed, 24.8% Future Development, 11.7% streets, and 10.2% available.<sup>44</sup>

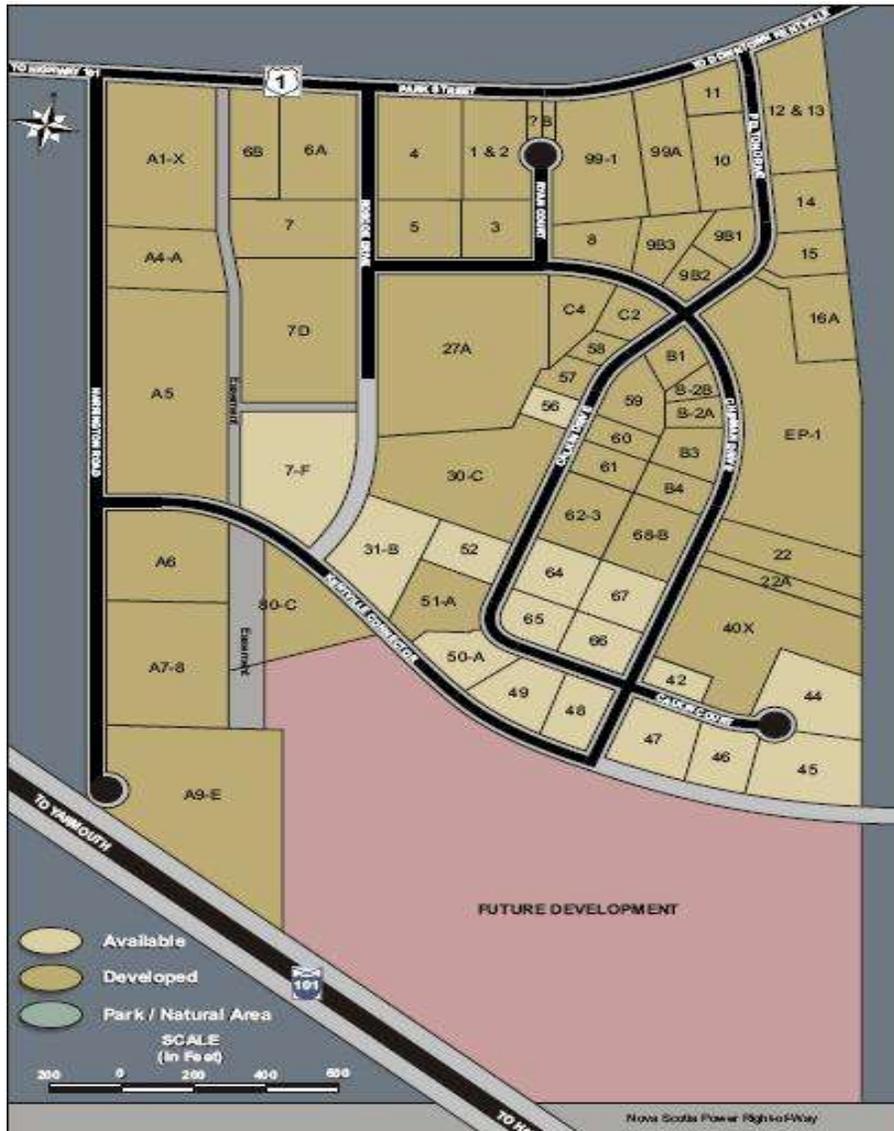


Figure 2: Kentville Industrial Park. Source: Nova Scotia Department of Transportation & Public Works, Real Property Services. “Annapolis Valley Regional Industrial Park.” Kentville: Government of Nova Scotia, July (2003).

If there were a search for abandoned industrial sites in Kentville in the distant future, the industrial park would likely be the only significant location worth investigating. The town’s Municipal Planning Strategy from 2001 noted that the past fifteen years of industrial growth in the town were steady and that further growth was desirable in order to maintain a strong tax base. There were hopes that the general economic growth of the valley region would draw more industrial activity into the town and the town has anticipated future growth by zoning areas to receive that growth.<sup>45</sup> Policy 1 stated “It shall be the intention of the Town Council to encourage the establishment of industries within the Town, and to promote their location within the Annapolis Valley Regional Industrial Park.”<sup>46</sup> As a part of policy 2, the new area was to be limited to specific industries in order to ensure the proper utilization of the land and to eliminate incompatible sources of growth.<sup>47, 48</sup>

## Conclusions

Kentville has been home to a wide variety of secondary industries and their rise and fall are intrinsically linked to the primary industries they supported. The specific firms that have operated in Kentville for the last 100 years have been fundamental to the creation and support of the primary producers of the valley. We expected to find some signs of industrial abandonment, especially surrounding the old roundhouse site, but were unsuccessful. The town of Kentville does not need to devote any significant effort in dealing with sites of industrial abandonment and likely will not have to in the near future. The majority of Kentville industry has been centralized in one peripheral location which limits further growth of industrial activity in any other town area. Whether through demolition, fire, or reclamation, Kentville's industrial sites have avoided any prolonged or current state of abandonment. The industry that has historically inhabited the town can best be summarized by the following excerpt from the June 8<sup>th</sup>, 1898 edition of the *Halifax Herald*: "In regard to manufacturing concerns, Kentville can boast quality rather than quantity."<sup>49</sup>

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<sup>1</sup> Town of Kentville, Municipal Office, "Dangerous and Unsightly Premises By-law Chapter 30: Repealed." *Town of Kentville*, (2007): 2.

<sup>2</sup> Carol Harmes. Conversation with Andrew Williams November 3<sup>rd</sup>, 2009

<sup>3</sup> Carol Harmes. Conversation with Andrew Williams November 3<sup>rd</sup>, 2009

<sup>4</sup> Ivan Smith. "Nova Scotia's Electronic Attic." <http://alts.net/ns1625/index.html>

<sup>5</sup> Ed Coleman. "Kentville as an Early Shipbuilding Area." January 30<sup>th</sup>, 2007.

<http://www3.ns.sympatico.ca/ecoleman/editorial/2007/e07jan30.html>

<sup>6</sup> W. C. Milner. *The Basin of Minas and its early settlers*. (Wolfville: Acadia University, 193-)

<sup>7</sup> A. W. H. Eaton, *History of Kings County* (Salem, 1910), 74-76.

<sup>8</sup> William H McCurdy. *The McKay Motor Car: Nova Scotia's first production car*. (Halifax: Petheric Press, 1968), 2.

<sup>9</sup> U,A, U,T. *The Halifax Herald*, 8 June 1898

<sup>10</sup> William H McCurdy. *The McKay Motor Car: Nova Scotia's first production car*. (Halifax: Petheric Press, 1968), 3

<sup>11</sup> Ed Coleman. "McKay Motor Car – Valley Made."

<http://www3.ns.sympatico.ca/ecoleman/editorial/1998/e98feb27.html#>

<sup>12</sup> Courtney Burrell, Conversation with Andrew Williams, November 29<sup>th</sup>, 2009

<sup>13</sup> Ed Coleman, Correspondence with Andrew Williams, October 13, 2009

<sup>14</sup> U,A, U,T. *The Halifax Herald*, 8 June 1898

<sup>15</sup> Courtney Burrell, Conversation with Andrew Williams, November 29<sup>th</sup>, 2009

<sup>16</sup> Courtney Burrell, Conversation with Andrew Williams, November 29<sup>th</sup>, 2009

<sup>17</sup> Louis. Comeau, *Historic Kentville*. (Halifax: Nimbus Pub., 2003)

<sup>18</sup> Ed Coleman, Correspondence with Andrew Williams, October 13, 2009

<sup>19</sup> Steve Dickie. "Timeline of Events. Nova Scotia Railway Heritage.

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<sup>20</sup> Dickie

<sup>21</sup> Hugh Allison Blackmer. *Agricultural transformation in a regional system : the Annapolis Valley, Nova Scotia*. (Stanford University, 1976), 82

<sup>22</sup> Blackmer, 63

<sup>23</sup> Hugh Allison Blackmer.

<sup>24</sup> Nova Scotia Department of Transportation & Public Works, Real Property Services, *Annapolis Valley Regional Industrial Park* (Kentville: Government of Nova Scotia, July 2003) 1.

<sup>25</sup> Nova Scotia Department of Transportation & Public Works, 1.

<sup>26</sup> Nova Scotia Community Planning Division. “Annapolis Valley planning region: information package.” *Halifax : The Division*, (1977), 30.

<sup>27</sup> Nova Scotia Community Planning Division, 30

<sup>28</sup> Town of Kentville, “Explore Kentville: Town History,” *Town of Kentville*, [http://www.kentville.ca/explorekentville\\_history.cfm](http://www.kentville.ca/explorekentville_history.cfm).

<sup>29</sup> Unknown Author. *The Chronicle Herald*, 14 March 1960.

<sup>30</sup> Steve Dickie. “*Timeline of Events*.” Nova Scotia Railway Heritage. [http://www.novascotiarailwayheritage.com/roundhouse\\_action\\_group.htm](http://www.novascotiarailwayheritage.com/roundhouse_action_group.htm)

<sup>31</sup> Unknown Author, “Kentville’s Redevelopment,” *Kentville Advertiser* 8 March 1973

<sup>32</sup> Louis Comeau. “*Historic Kentville*.” (Halifax Nimbus Pub, 2003)

<sup>33</sup> Steve Dickie.

<sup>34</sup> Steve Dickie.

<sup>35</sup> Kirk Starratt, “Artefacts, Reusable Construction Materials Recovered from CP Rail Site,” *Kentville Advertiser*, 7 Oct. 2005.

<sup>36</sup> Steve Dickie. “*Timeline of Events*.” Nova Scotia Railway Heritage.

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<sup>37</sup> Kirk Starratt, “Artefacts, Reusable Construction Materials Recovered from CP Rail Site,” *Kentville Advertiser*, 7 Oct. 2005:

<sup>38</sup> The Heritage Canada Foundation, “Featured Heritage Buildings: Heritage Lost,” *The Heritage Canada Foundation*, <http://www.heritagecanada.org/eng/featured/risk.html#worst>.

<sup>39</sup> Jay Johnson, “Re: Information Inquiry” e-mail to Lassonde Industries representative, 17 Nov. 2009.

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<sup>42</sup> Nova Scotia Department of Transportation & Public Works, Real Property Services, p. 1.

<sup>43</sup> Kentville Town Council, Council Advisory Committee, “Kentville Town Council Minutes” *Kentville Town Council*, Sept. 2009) 1.

<sup>44</sup> Nova Scotia Department of Transportation & Public Works, Real Property Services, *Annapolis Valley Regional Industrial Park* (Kentville: Government of Nova Scotia, July 2003) PG 1.

<sup>45</sup> Town of Kentville, “Municipal Planning Strategy 2001”, *Kentville: Town of Kentville*, (2001) 59.

<sup>46</sup> Town of Kentville, Pg 59.

<sup>47</sup> Town of Kentville, Pg 59

<sup>49</sup> Nova Scotia Department of Transportation & Public Works, Real Property Services. “Annapolis Valley

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# Chapter 5: Quarrying and Dumping in Kentville and its Environs

– *Atoya George and Patrick Gouthro*

## Introduction

At first glance, a project that combined quarrying and dumping could not be any more disparate or mutually exclusive for one activity involves the removal of naturally occurring material from the earth while the other involves the deliberate infusion of non-natural materials, mostly man-made, into the environment, but that might not tell the whole story. Both activities are the result of human activity that dramatically changes the environment and not necessarily for the better. Both began as a relatively unregulated human activity but, as time has progressed and amidst a growing environmental consciousness, both have increasingly become a highly regulated activity subject to higher degrees of environmentally-conscious municipal, provincial and federal regulatory operating procedures with their corresponding increasingly punitive sanctions if these laws, policies and guidelines are not followed. In a very real sense, the human activities of quarrying and dumping are considered to be a necessary evil despite the best efforts at reducing, reusing, and recycling or trying to mitigate the environmental consequences of removing, perhaps, thousands of tonnes of earth, sand, rock or stone. In constructing a historical baseline for Kentville and its history of quarrying and dumping, one must strive to seek a balanced view as, while these activities might seem repellant in a purely visual or aesthetic sense through their contributions to the scarification of the town and its environs, they also contribute directly to the standard of living and quality of life enjoyed by the inhabitants of Kentville.

## Quarrying

Even from the beginning of European settlement in Nova Scotia to the present day, there have been forms of quarrying or mining in order to procure materials for the building of structures such as houses, bridges, railroads, and roads. Historically, quarrying was often undertaken by private individuals or companies with little or no restraints upon their activities but in the past two decades it has become one of the most highly regulated activities in the province. To have a clear delineation between various forms of the same general activity, definitions are necessary to spell out what is the nature of the act of quarrying and how it might be easy to construe it as being something else entirely. A quarry is an “excavation, requiring the use of explosives, made for the purpose of removing consolidated rock from the environment” while a pit, which the general lay person might mistakenly confuse as being a quarry, is an “excavation made for the purpose of removing aggregate without the use of explosive.”<sup>1</sup> It is clear then that quarrying, as an economic activity and as an excavation practice, is much more intrusive and potentially harmful to the environment and is, generally, of more concern to the community at large. As an activity, quarrying has had a relatively late start in Nova Scotia but, for all that, it still enjoys a considerable heritage and lineage in Nova Scotia generally and in Kentville and the wider Annapolis Valley particularly.

During the Acadian period, “All the houses [were] low, made of pieces [i.e., logs] of wood.”<sup>2</sup> This pattern persisted well after the Expulsion of the Acadians and the arrival of the

New England Planters. Even the primary focus of imperial rivalry during the first half of the eighteenth century, the fort at Annapolis Royal, was often in poor repair “since the only building materials in the vicinity were wood, sand, and sod.”<sup>3</sup> In this early period of colonization and settlement of Nova Scotia, it was the availability of materials in the general local area that could be reached by ship or vessel that would or could be utilized in the construction of buildings or other needed structures like bridges. As is evidenced in other areas, such as the fact that “Every harbour and river from Pictou to Amherst affords building stones, frequently of good quality,”<sup>4</sup> so too were the local rivers and waterways mined for sizable stones suitable for construction of building foundations in Kings County, including Kentville. The Stewart House on Front Street in Grand Pre was “built on a foundation of field rock and brick, and is of a style common to this area and period.”<sup>5</sup> The Eaton-Van Oostrum House in Upper Canard had a cellar wall that was constructed out of “open field stone.”<sup>6</sup> In the shire town of Kentville, the Stagecoach Apartments or, what has become more commonly known as the Kentville Inn, followed similar construction methods. Building a house upon a solid rock or stone foundation seems to have been a matter of course for this particular time as this was a pragmatic type of construction as, with the example of the Chignecto marshlands, it sought to “secure a dry foundation (as well as a defensive position) for the buildings, [and so] low ridges and islands of rock were utilized.”<sup>7</sup> Whatever was visible to the naked eye could be and often was used for building purposes and this persisted well into the twentieth century. One particular member of a construction company recalled that finding enough gravel and other aggregate materials for road construction tended to be a hit or miss proposition. While participating in tendering bids in a 1953 road contract from Bridgetown to Annapolis, a particularly nice-looking section of gravel caught his eye in his travels along the route. Despite it being located next to a graveyard and just down the road from a community hall, the company got the necessary permissions to extract the gravel and the amount of aggregate was just barely enough to finish the job.<sup>8</sup>

It is in terms of road construction that quarrying has had a considerable history going all the way back to the eighteenth century. Roadways in the Annapolis Valley were built on the sites of ancient trails that the Mi'kmaq had used for literally hundreds and perhaps thousands of years.<sup>9</sup> The modern road and highway systems that are currently in place today were formed largely on the basis of those elaborate networks of aboriginal inland trails that ran throughout the province.<sup>10</sup> Building upon the Mi'kmaq foot paths and trails, colonial cart roads gradually evolved in the eighteenth century from a sea of mud into something that modern day society might easily recognize as resembling a road. Cart roads were repaired and built according to the following instructions:

Make first repairs on the worst places by lacing Fascines (long bundles of wood) in the hollow places and over them large stones, broken with an Iron Mall [*sic*], and then cover the whole with earth, which is to be taken from a Trench on either side of the road which will become a Drain to carry off the water and thereby preserve the work Compact and Firm.<sup>11</sup>

Again, the stones might be collected from wherever was convenient, likely as close as possible to the building site, and the earth was quarried or mined from the sides of the road to build up the actual road itself. In an 1892 report, Dr. M. Murphy, a provincial engineer, advocated the use of stone-breaking machines to be able to produce enough crushed stone or gravel to

stabilize the problems of road maintenance by giving them a “coating of well-drained, broken stone.”<sup>12</sup> Unfortunately for the time, the cost of employing of such machinery was prohibitive.

The new environmental consciousness which began to develop in North America in the late 1960s and early 1970s had a major impact on the operation of pits and quarries in Nova Scotia. In the 1971 Throne Speech the provincial government of Gerald A. Regan announced its intention to establish a Department of the Environment. Despite Regan’s minority government status, the Session was also asked to “consider a measure designed to avoid aesthetic and environmental damage by approving regulations controlling the location and operation of gravel pits and quarries.”<sup>13</sup> Regan’s government collaborated with industry in developing a set of environmental rules and regulations for “asphalt plants, borrow pits, quarries, gravel pits, water courses etc.” but, while the Environment committee submitted their recommendations to the Department of the Environment, it was not until 1981 that they were officially presented.<sup>14</sup> The decade of government and industry collaboration and consultation had been justified by industry’s need for time to adjust to the new proposed regulations or else propose practical alternatives.<sup>15</sup> For their collaboration with government in this process, no matter how long it delayed implementation, the Nova Scotia Road Builders Association (NSRBA), were awarded with a Certificate of Merit in the Industrial Category for “an increasingly conscientious approach to environmental protection in the course of highway construction.”<sup>16</sup>

This collaborative rapprochement between government and construction companies did not last for very long. Again, paralleling outside environmental awareness, in September 1991 the Department of the Environment introduced a new discussion paper on the environment and environmental regulations enforcement in the province. It advocated a much broader environmental focus than it had done before and argued for “sweeping enforcement powers and penalties for perceived non-compliance.”<sup>17</sup> The tangible result of this discussion paper was a new provincial Environmental Act that was introduced, tabled and finally proclaimed in January 1995.<sup>18</sup>

Nowadays the environmental rules and regulations governing pits and quarries have only become tougher in a series of increasingly restrictive, environmentally-friendly policies and amendments that have governed quarry activities in the past fifteen years. According to the *Pit and Quarry Guidelines* (1999), all pits and quarries in Nova Scotia must automatically undergo an Environmental Assessment if they exceed four hectares in size and are primarily engaged in the “extraction of ordinary stone, building or construction stone, sand, gravel or ordinary soil.”<sup>19</sup> Not just new sites, but any “modification, extension, abandonment, demolition or rehabilitation” of older or existing sites may be required to undergo such an environmental assessment.<sup>20</sup> Besides allowing that sites smaller than four hectares need not go through the environmental assessment process, the provincial regulations also exempt pits and quarries that are established for the sole purpose of providing fill or aggregate materials for road building or maintenance contracts held by the provincial government.<sup>21</sup>

Despite strict guidelines and regulations, quarries can be an inflammatory subject that pit communities against business and corporate interests. Nowhere is this more evident than the the local community furor over a potential quarry site on Digby Neck. Bilcon of Nova Scotia Corporation had proposed the construction, operation and eventual decommissioning of

a large basalt quarry, processing facility, ship loading facility and marine terminal at White's Point, Nova Scotia for the export of some two million tonnes of aggregate annually to New Jersey over a fifty-year time period.<sup>22</sup> In its assessment and elucidation of its principles and criteria, the Joint Review Panel included sustainable development along with four other guiding review principles: public involvement, traditional community knowledge, an ecosystem approach, and the precautionary principle.<sup>23</sup> In denying the project the necessary permissions to go ahead, the White's Point decision may have effectively expanded the concept of sustainable development by associating it with other somewhat more subjective and community-friendly ideas. Still, what was the significance of the proposed quarry dispute, what does it mean in terms of sustainable development, and did this decision give it legislative teeth? On this, the jury is still out.

There did seem to be a balance in how the Joint Review Panel went about its deliberations as it wrestled with determining if the proposed project would result in significant environmental damage or whether it was actually in the public's interest that such a project go ahead. Given the intensity of the opposition, it may well have been that the general public is averse to supporting any large-scale quarry production that irrevocably alters the natural environment and especially if it does not have any perceived local or provincial benefits. In both these respects, the profits generated by the quarry would have gone to some American subsidiary company, with little perceived job creation or economic spinoffs to the local community, and the massive amounts of quarried material would have gone to pave roads in the United States.

Contrast the experience of Bilcon, whose proposed quarry expansion became a regional concern, with that of Shaw Resources, a locally owned and operated company with a long tradition within the province, as they engaged in the environmental assessment process for an expansion of their Lovett Road Aggregate Pit operation located just outside of Kentville. The Lovett Road pit operation also benefitted from the fact it was only a seven or eight hectare site as compared with the one hundred and fifty hectare site that Bilcon proposed.<sup>24</sup> The difference in production scale and schedule operation is significant as well for Shaw wanted to extract fifty thousand tonnes of aggregate per year but also that the "operating schedule for the project will be ... primarily during the spring and summer months."<sup>25</sup> Rather than a year-round quarry operation, Shaw operates its pit site during the commonly accepted road building and construction time in the province. Like most of the pits and quarries operating in Kentville and its environs, Shaw is the prototypical example.

There are very real environmental concerns regarding pits and quarries and the following list by no means comprehensively covers the full range: sedimentation and run off, leaching of chemicals, dust, blasting noise and vibrations, water contamination, and water depletion or lowering of the water table. Visuals or aesthetics of the community are important especially when the Annapolis Valley region, like much of Nova Scotia, boasts a significant tourism infrastructure that contributes significantly to the region's economy. Unlike other forms of mining activity which take place largely underground, pits and quarries are by definition, above ground operations that change the environment in a permanent and highly visible way. Once that rock or mineral had been removed from the earth there is no going back and undoing it. The permanence of environmental change that the mining activity of pits and quarries engenders is mirrored by the process of mitigation. How is the pit or quarry site to be

mitigated or made acceptable to the community? There seems to be a willingness to accept pits and quarries, for locally owned companies with a history or link to the province and only if the operation is on a small scale, and for such purposes as roads and construction that are for local or provincial benefits but virtually nobody wants them in their neighbourhood.

## Dumping

Dumping in Kentville has evolved from being the process of the disposal of mere trash to a significant, community-based activity that encompasses recycling, waste diversion, and complex land-use activities. Dumping policies encourage “hands-on” environmental behaviour among a significant majority of the population of Kentville; indeed, recycling and waste sorting is probably the most common environmental task carried out on a regular basis by the town’s inhabitants.

### Municipality’s Interference in Solid Waste Disposal

Dumping as a whole could have profound effects on the environment. These effects can include but are not limited to contamination of ground and surface water and their surroundings. Before the 1940s, the people of Kentville were unaware of the impacts that pollution of solid waste could have on their environment. In the 1940s, awareness of garbage and its effects on the environment began to surface, however. It remains difficult to decipher the exact reason for this awareness. Were individuals of that time genuinely concerned about the impact that garbage had on the environment or was their attentiveness to the issue the result of their concerns of the impact of dumped material on their properties’ aesthetic image?

In order to get a grip on the solid-waste management issue in Kentville, the municipality took the initiative. Their actions resulted in the first garbage bylaw, implemented in 1943. This demarcated the legal and illegal forms of dumping in the town. Although the government made provision to remove trash from the environment, it was not a primary concern to its inhabitants. The first solid-waste management bylaw issued was basically very brief in its definition and vague in its requirements of the town’s inhabitants. This bylaw essentially accepted all waste products to be disposed of in the same way and in the same container/bag. Its only restriction was the separation of substances such as glass and unflattened tin cans that could not be destroyed by ordinary incendiary methods. Collection of waste occurred on a weekly basis, with no baggage limits. This of course encouraged lots of waste to enter the landfill sites.

Around the time of the planning and passing of the first bylaw, it seems that the inhabitants of the town were not especially interested in the way in which their garbage was disposed. Their only concern appeared to be that their trash was being removed from their homes, very much in an “out of sight, out of mind” attitude to the problem. Interest in the garbage’s ultimate whereabouts and the effects that it may or may not cause to the area to which it was sent was not of any concern to the town’s residents. Level of interest in the bylaw may be seen in the newspaper articles that were printed on the subject around this time, in which it was clear that people were glad that the problem of household waste management had been solved – for them.

Garbage began to receive further attention in the 1980s and early 1990s, especially after 1989 when the first provincial Recycling Act was proposed. The purpose of this act was “to provide effective waste-management practices, to encourage recycling and to protect the environment” (Recycling Act, 1989). This new outlook on the environment was the result of the intensive struggle that Kings Environmental Group (KEG) had led to force municipalities to engage in waste recycling. The KEG made their announcement of their accomplishment in March 1989 in their newsletter:

In the recent speech from the Throne, under the heading Waste Management and Recycling, we were told that our present government is committed to the principles of recycling, that legislation is pending and that recycling is environmentally prudent...KEG has been fighting long and hard for recycling. We are pleased that the county will soon have a blue box recycling program.

The recycling act was also pushed by the study conducted on Kings County in December 1987. The results of the study were staggering and showed cardboard equaling 20% of all garbage being deposited into the town’s landfill. With these results, KEG were able to help make a change to the blue box recycling program. This created two streams of garbage, the recyclables and all other waste (garbage), thus marking a decisive moment in the community’s waste management practices.

Unaware of the tremendous effects dumping of solid-waste can have on the environment, many community members did not adhere to the town’s new Bylaw 18 governing waste management. Limited environmental knowledge played a major role in this. Citizens’ awareness however, was increased in the early 1990s. Grace Proszynska, the Town of Kentville’s Bylaws Enforcement Officer, explained the increased awareness as follows:

As far as the illegal dumping goes there was lots of it in the old days; most of it remained unreported. The citizens’ awareness on environmental impact of bad solid waste management went up in the 90’s and the reporting of old illegal community dumpsites in the woods as well the reporting of any newly dumped materials in the countryside, in the ditches, back alleys in the Town, and in privately operated commercial dumpsters went up. New programs were established in the late 90’s and early 2000’s helping municipal governments to deal with cleaning up the old dumpsites. For the last three years Valley Waste offers a waiver of tipping fees, when granted through a case investigation, so a property owner affected by an illegal dumping gets an incentive to clean up their site.

The year 1999 saw a high level of activity occurring within the town of Kentville. The province of Nova Scotia had already made some large steps to becoming more environmentally friendly. Between 1996 and 1999, there had been a ban on depositing items such as compostables (paper towels, food scraps etc.), recyclables (papers, plastics, cans, etc), used tires, etc, into landfills. Apart from these bans, the province also enforced new regulations for landfills, which included that a lining be installed in dumpsites to prevent leaching of contaminants into groundwater, surface water, and other aquatic bodies. The town of Kentville had to make some changes to

comply with these new regulations. One of those changes was placing Valley Waste Resource Management (VWRM) in control of solid-waste management in Kings County.

VWRM is an authority in Kentville that is currently responsible for the receiving, sorting and shipping of waste resources from all of King's County. The relationship between VWRM and municipalities in the county is a close one: VWRM suggest recommendations, for example to changes to the bylaws, and the municipalities review, approve and enforce these bylaws. Andrew Garrett, Communications Coordinator of VWRM, noted that:

We [VWRM] have a very good relationship with the Town of Kentville and all our other partner Municipalities. We have a unique Inter-municipal Agreement by which each municipality has a rep that makes up our authority. They are involved in all major decisions and help form our vision. Our administration office, Eastern Management Centre and our recycling processor are all located in Kentville.

In addition to the change in authority and regulations, 1999 was also the year that Meadowview landfill was closed. All these events received a great amount of attention in the community. In 1999 there were over 20 articles addressing the Meadowview Landfill and garbage issue in King's County in the Kentville *Advertiser* alone.

On their journey to collaborate with the new regulations enforced, VWRM generated an updated version of a new bylaw that later replaced the old Bylaw 18; this was Bylaw 55. In this legal regulation, the VWRM developed detailed definitions of the various types of waste (e.g., cardboards, bulky items, food wastes, etc.) and authorities involved, the prohibitions (such as illegal dumping), how garbage should be separated, the management of construction and demolition wastes, and waste-handling resources and penalties.

In addition to these generally commercially-focussed regulations, the bylaw allowed households up to 8 bags of refuse that were to be picked up every 2 weeks. This basically aimed towards waste reduction. With the enforced reduction program of solid waste from residential homes and knowing that homeowners need to periodically remodel their homes and clear their yards from fall leaves on an annual basis, the VWRM also established a cleanup period (known locally as "big garbage day") twice a year in which residents are free to dump their refuse at the roadside with very few limits and at no charge. A special fall leaf-collection program is also in place to minimize illegal dumping of fall garden waste and to prevent its burning as much as possible.

At the beginning of the assumption of solid-waste management policy by VWRM, the organization was able to receive and handle residential waste and other regular wastes such as those from schools, restaurants, etc. They however were faced with one problem when it came to disposal of construction and demolition waste. This problem was their inability to hire a private contractor that could aid in the disposal of this waste. For this, Valley Waste wanted to extend the close date of Meadowview landfill, but this extension did not occur because of resistance among local residents near to the landfill site.

This new bylaw did not pose much of a difference to the residential sorting and handling of waste, it only now required individuals to clean and dry their plastics and tins before bagging them. This of course generated some criticism among certain community members. Alf Gerrits, a resident of Kentville, expressed his disapproval for all the labor that was required in order to dispose of his waste. In a March 19<sup>th</sup>, 1999, letter to the *Advertiser* he stated that there was once a time when residents could take their garbage out and it would be dealt with accordingly, however, they now have to spend time rinsing cans, washing plastic bags, reading recycle codes, bagging newspapers, removing covers off of jars and purchasing black and blue bags. He also hinted that they were paying their taxes via their time instead of money. Although he did believe in the three R's (reduce, recycle, reuse), he queried if it was possible for the sorting stations to reduce their efficiency in garbage separations.

Bylaw 55 was the first strict law on dumping issued by the municipality. This bylaw however only lasted a year before amendments were made; it was later replaced entirely by Bylaw 61 which contained more strict and specific rules. The new bylaw's coverage included:

- 1) Definition and separation of household hazardous waste.
- 2) Section on "Removal of Collection Containers from Roadside" has been changed to two subheadings, "Removal of Collection Containers" and "Uncollected Waste-Resources" (this showed what measures VWRM would undertake to make sure that individuals observed requirements)
- 3) Insertion of a Waste-Resource Store (this pertained to the bins in which the bags of waste from multi-dwelling residences, for example apartment complexes, were kept while they wait to be picked up by the garbage collectors)
- 4) Insertion of Owners and occupants' responsibilities
- 5) A broader definition set covering potential violations was included (encompassing such areas as improper placement of containers, improper "set-out" time and improper collection containers, etc.)
- 6) Non-compliance penalties were also increased to a maximum of five thousand dollars

The bylaw also included tipping fees for commercial businesses and for those residential individuals who exceeded the limited amount of garbage and have to take their garbage to the VWRM center on their own. These fees of course were intentionally biased against individuals or companies that deposited large amounts of garbage (waste that went directly to landfills) and in favour of those who had recyclables and compostables (that is, those individuals whose garbage was sorted).

The public's education on the new system/program implemented was not great at the initial years of their regulations. As a result of this there was a great deal of illegal dumping occurring within the area. Valley Waste reacted to this challenge by the issuance of a warning to the public via the aid of the newspapers. In 2002 this warning titled "There is no Excuse for Illegal Dumping" was posted publicly several times throughout the year in several local media outlets. After four years of going strong with Bylaw 61, in 2004 it was replaced by Bylaw 66. The new bylaw's changes, however, only included some reworded definitions and some minor structural changes.

In 2008, Bylaws 61 and its modification, Bylaw 66, were both repealed by the implementation of Bylaw 76. The major difference between this law and the previous policies was the implementation of the Clear Bag Waste Collection program. Its purpose was to provide a means for safe and easy monitoring of the waste being disposed. With this change, collectors can make sure that the community members are following the requirements of the bylaws. This of course created some controversy between the authorities and the community members as the individual community members felt that VWRM and the municipality were invading their privacy. This matter was easily solved as the community was given an allowance of one black bag per collection period.

### Dumpsites in Kentville

Whereas landfills have their benefits in terms of removing solid waste from residential homes and businesses and reducing pollution in the territory, if not assembled and monitored properly, they can cause more damage than good, that is, they can contaminate their local environment. The Town of Kentville was fortunate enough to avoid placement of dumpsites in their “backyard”. The town and surrounding county first relied on the Meadowview Landfill for waste disposal. This landfill was used from 1943 when the first bylaw mandated its operation to 1999 when it was closed because it was full and did not meet new provincial regulations governing appropriate landfill site protection (these included a lining to prevent leaching of contaminants in to ground and surface water).

When VWRM became both a policy-formulation and practical-implementation partner in Kings County in 1999, they were able to implement different measures that allowed the community members to reduce the waste entering the landfills. From 1999 to the present, Valley Waste became the intermediate post for garbage collection in this county. Solid waste would be collected and sorted at the VWRM center in which the recyclables would be degraded and exported from the region (compostables, for example, are transported to a centre in Halifax, while unrecoverable garbage is transported to the Chester landfill site).

### Goals and Accomplishments of Solid-Waste Management over the years

The main goal of the municipality of Kentville was first to remove garbage from the community and its surroundings and to prevent garbage from damaging the environment. With the change in provincial regulations and the involvement of Valley Waste Resource Management, the goal has shifted to focus on more eco-friendly policies that aim to reduce the amount of waste entering landfill sites via the aid of the three R’s (Reduce, Reuse, Recycle) program. As John DeCoste noted in a 2001 Kentville *Advertiser* article waste redirection had increased from 18% of total wastes to 53% within a year of VWRM taking over the waste management of the county. This was attributed to the broad policy initiatives that combined education with new, stricter guidelines and appropriate deterrents. Andrew Garrett, VWRM’s Communication Director, reported in November 2009 that the Meadowview landfill when it was in full operation received about 50,000 tonnes of garbage every year. Thanks to new policies and guidelines, together with stronger environmental consciousness among the population, garbage reaching the VWRM facilities top out at roughly 20,000 tonnes annually.

Valley Waste's policy of collecting garbage biweekly also increased the chances of people working harder to reduce their waste generation. No one would like "stinky" garbage piling up in their homes or basements for 2 weeks. So in this, they will monitor what they use so they would not have large amounts of garbage in at their homes.

### The cost of previous mistakes

Although the town of Kentville did not directly pay for the dumping of garbage in the Meadowview landfill, in terms of contamination of its water bodies and surroundings, the community nevertheless paid in other ways, and still does so today: monitoring and testing of the landfill site continues today, and will do so for a long time to come, in order to ensure that contaminants do not leach into the nearby waterways. KEG in their newsletter in 1990 made reference to the capital being used to sustain Meadowview landfill site:

The Meadowview landfill requires significant additional capital and operating funding in the short term in order to improve conditions at the landfill. Improvements are required to reduce infiltration and hence leachate at the site and to install methane venting infrastructure. As well, a major litter abatement program is required. Capital Estimates are forecast at \$612,000 and an increase in annual operating cost of \$162,000.

Despite the closing of the site, monies are still being directed for this project in order to conduct annual tests to aid in the prevention of a large surface area being contaminated. Although these amounts were shared between all of Kings County, it is still quite a substantial amount of money that could have benefited the community in another way.

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<sup>1</sup> *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia, Province of Nova Scotia*, Policy and Corporate Services Branch, Environmental Assessment Branch, Revised September 2009. i.

<sup>2</sup> W.I. Morse, Sojourn of Gargas in Acadie 1687-8, *Acadiensia Nova* (1598-1779), vol. I, 1935, 179. As Quoted in J. Brian Bird, "Settlement Patterns in Maritime Canada: 1687-1786," *Geographical Review*, Vol. 45, No. 3 (Jul., 1955): 389.

<sup>3</sup> J. Brian Bird, "Settlement Patterns in Maritime Canada: 1687-1786," *Geographical Review*, Vol. 45, No. 3 (Jul., 1955): 389.

<sup>4</sup> Robert Randal McLeod, *Markland or Nova Scotia: Its History, Natural Resources and Native Beauties*, (Berwick, N.S.: Markland Publishing Co., 1903), 483.

<sup>5</sup> Heritage Trust of Nova Scotia. *Seasoned Timbers: Volume One, A Sampling of Historic Buildings Unique to Western Nova Scotia*, (Halifax: Heritage Trust of Nova Scotia, 1972), 58.

<sup>6</sup> Heritage Trust of Nova Scotia. *Seasoned Timbers: Volume One, A Sampling of Historic Buildings Unique to Western Nova Scotia*, (Halifax: Heritage Trust of Nova Scotia, 1972), 62..

<sup>7</sup> J. Brian Bird, "Settlement Patterns in Maritime Canada: 1687-1786," *Geographical Review*, Vol. 45, No. 3 (Jul., 1955): 392.

<sup>8</sup> As related in Paddy Muir, *Great Roads: A History of the Nova Scotia Road Builders Association*, (Halifax, N.S.: Nova Scotia Road Builders Association, 1995), 136.

<sup>9</sup> Paddy Muir, *Great Roads: A History of the Nova Scotia Road Builders Association*, (Halifax, N.S.: Nova Scotia Road Builders Association, 1995), 10.

<sup>10</sup> Muir, *Great Roads*, 12.

<sup>11</sup> Muir, *Great Roads*, 14.

- <sup>12</sup> Muir, *Great Roads*, 19.
- <sup>13</sup> Muir, *Great Roads*, 52.
- <sup>14</sup> Muir, *Great Roads*, 58-9.
- <sup>15</sup> Muir, *Great Roads*, 52.
- <sup>16</sup> Muir, *Great Roads*, 59.
- <sup>17</sup> Muir, *Great Roads*, 74.
- <sup>18</sup> Muir, *Great Roads*, 74.
- <sup>19</sup> *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia, Province of Nova Scotia*, Policy and Corporate Services Branch, Environmental Assessment Branch, Revised September 2009, i-ii.
- <sup>20</sup> *Guide to Preparing an EA Registration Document for Pit and Quarry Developments*, i-ii.
- <sup>21</sup> *Guide to Preparing an EA Registration Document for Pit and Quarry Developments*, i-ii.
- <sup>22</sup> Joint Review Panel Report, *Environmental Assessment of the Whites Point Quarry and Marine Terminal Project*, (October, 2007), 1.
- <sup>23</sup> Joint Review Panel Report, *Environmental Assessment of the Whites Point Quarry and Marine Terminal Project*, (October, 2007), 1.
- <sup>24</sup> Environmental Assessment, Lovett Road Aggregate Pit Expansion Province of Nova Scotia, 2009; available from <http://www.gov.ns.ca/nse/ea/LovettRoadPitExpansion.asp>; Internet; accessed 20 November 2009.
- <sup>25</sup> Registration Document Section I: Environmental Assessment, Lovett Road Aggregate Pit Expansion Province of Nova Scotia, 2009; available from <http://www.gov.ns.ca/nse/ea/LovettRoadPitExpansion.asp>; Internet; accessed 20 November 2009.

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# Chapter 6: Recreational Spaces in Kentville

– *Kaitlyn Steele and Alisha Whynot*

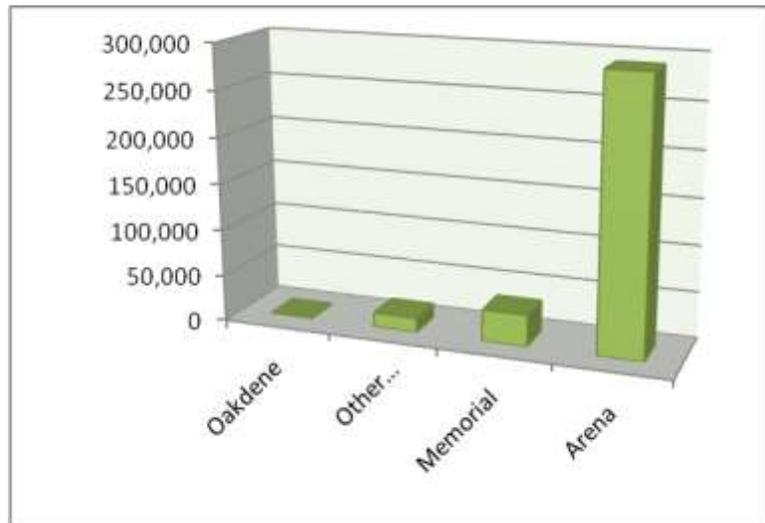
## Introduction

The recreational spaces of Kentville seem to be important, both to the community and town council. However, over the past four months our research has shown that at least two of Kentville’s six recreational areas have not been receiving the necessary budgetary support in comparison to the other four spaces. The four green spaces on which the town focuses most of its spending are spaces that bring the most revenue and also have a productive use within the community. This creates an imbalance in communal use, which feeds back to the shortfall in the budgetary support for these under-utilized parks. This imbalance thus creates a downward spiral for the parks, catching them in a continual cycle where the lack of communal use equals a decrease in the monetary support which is necessary to bring residents to the parks.

## Budgetary Environment

When looking at the Town of Kentville operating budget it is easy to see the aforementioned cycle of neglect creates either a downwards or upward spiral for the parks. The chart at right shows the expenditure of the Town council on the ‘four’ main recreational venues (the Town of Kentville’s current Operating Budget labels a section as ‘Other Parks’, and it was assumed that this represents the Kinsmen’s

Participark and the Kentville trail).<sup>1</sup> In comparison to Oakdene, which only receives one thousand dollars in extra expenditure beyond general maintenance, and also has no rental hours, being a park that is for casual recreational use, Memorial Park has 75 hours of rental time per week in peak season<sup>2</sup> as well as access to \$34,000 for expenditure projects on top of the support offered for general maintenance. David Paterson, a business student at



Acadia university, argues that Kentville seemed to be putting all of its eggs into one basket by only giving Memorial the necessary funding. He also explained that all projects which create revenue can only do so for a limited period before their revenue becomes stagnant. Even if the town continues adding onto Memorial Park, or beautifying it, they can only increase its profitability until the park maximizes its rental hours, at which point it will no longer be able to increase its revenue.<sup>3</sup> Would it be profitable, for one year, to decrease the expenditure on Memorial by ten thousand dollars, and put that into a park like Oakdene? By putting funds into a green space which is caught in the downward spiral, the Kentville Town council could not only improve the green space, but potentially raise the prices of houses for sale in the area. Such

a project could only increase Kentville’s wealth, because rising property value would increase property taxes. The same can be said for the Kinsmen’s Participark.

The sum of money spent on the Kentville Arena figuratively speaking blows the amount spent on the rest of Kentville’s recreational spaces out of the water, with an expenditure of \$290,800 for the 2008/2009 year. It is interesting that the arena gets over eight times the spending money as Kentville’s largest green space, and it leads at least to the speculation that the discrepancy in funding between the indoor venue and the greenspaces shows that the recreational heart of Kentville does not lie within its community parks.

Although the Arena is a recreational space, the sections below focus mainly on greenspaces. Green space, while purportedly important to the residents of Kentville, hardly receives enough funding to be fully utilised by the public. Because the overwhelming majority of the Town of Kentville’s recreational budget goes into the two major seasonal venues, the Arena and Memorial park, there is not enough left over to fully optimize the smaller parks’ potential.

Park Discussion: Oakdene

Oakdene is a park located on the north end of Kentville between Oakdene Avenue and Campbell Road. The park was a \$50,000 park project and was developed with assistance from the provincial government and Kentville’s Department of Recreation and was formally opened on the same day as Participark in the fall of 1981.<sup>4</sup> In Kentville’s current facility inventory, Oakdene Park includes a ball field, soccer field, a duck pond used for skating in the winter, a play park for children, and a few paths and trails.<sup>5</sup> As mentioned before in the budget section, Oakdene only receives approximately \$1,000 for improvement and renovations, which is a miniscule amount compared to that allocated to Memorial Park. Because of its small budget, Oakdene currently seems to be suffering in the continuous cycle previously mentioned where lack of use by the community is a consequence of the lack of money for the maintenance and repair of the park’s facilities.



*Figure 1: Entrances and Parking at Oakdene Park. Note the poor signage. Photographs by Kaitlyn Steele and Alisha Whynot.*

The first symptom of this downward spiral is the current upkeep and upgrading of Oakdene Park. As you drive along Oakdene Avenue or Campbell Road the park is very difficult to spot. There are no signs present to suggest a park is near except for the general “children at play” signs. The actual entrances to Oakdene are very untidy and unmarked. The entrance on Oakdene Avenue does not look like the entrance to public green space at it appears to be more of a driveway. Similarly, the entrance on Campbell Road is unmarked as well, and only displays the “children at play” signs. The entrances as shown in the pictures above are currently looking very run-down and one can see how the Oakdene entrance does not indicate the presence of the park that is just beyond the path. Unattractive entrances suggest that the current budget for Oakdene has not been used for the upkeep of the entrances or signage. This in turn cannot but have a negative impact on the park’s usage patterns.

Along with the lack of signage, the general upkeep of the park also seems to be lacking. The facility inventory states that Oakdene Park has a storage shed, which is indicated the photograph below left.<sup>6</sup> The back of the shed has been vandalised in the form of graffiti. From what a resident has said, this graffiti has been there for quite some time and the town has not yet made an attempt to erase it, suggesting that the town has failed to allocate the money in the recreation budget to fix these small things. Another area that seems to have suffered from a lack of upkeep is the children’s play park located just inside the Oakdene Avenue entrance of the park. The play park is pictured below right, and it can be seen that the play-zone’s sand is scattered well beyond its designated areas and interlaced with the grass. The general feel of the park is one of run-down neglect, yet a relatively small injection of capital would allow for the beautification and rehabilitation of the park. Small budgetary allocations like this that have been left out of the budgetary allowance have a major impact on how the park is viewed and how it is used by the community. If the area is not kept up to date or if it does not look nice, then the community will neglect it as a result. Thus, one can see the downward spiral in effect by looking at the upkeep of the park.



*Figure 2 and 3: Equipment / Storage Shed (Above Left) and Play Area (Above Right) at Oakdene Park. Photographs by Kaitlyn Steele and Alisha Whynot.*

Since Oakdene is such a large developed green space, a number of controversies have been presented as a result area’s progressive dilapidation. There have been many ideas of what could possibly replace Oakdene, since it is such a large space. In an article published in the Kentville *Advertiser* in 1978 it is written that “a new park [Oakdene] is being built in the north

end [of Kentville], on land originally acquired for a school.”<sup>7</sup> This shows that the land that is now Oakdene was not originally planned to be a park. Since the land was originally meant to be a school, then there has to be questions of what else could be done with the land. Mark Pearl from Kentville’s town council says, “Oakdene is a designated green space and cannot be changed without full acceptance from the community.”<sup>8</sup> He then goes on to say that even though Oakdene is a designated green space, the council still listens to all offers made on the land. Mark Phillips, the Director of Recreation in Kentville suggested that Oakdene will not be lost to those residents in North Kentville as it is an important space to them because it is convenient for those residents who cannot always go to other parks available and because it provides a place for green space and recreational activities within a suburb of the town.<sup>9</sup> It is therefore apparent that this space, although controversial, is an important part of the north end of Kentville; if this is the case, then political will may be sufficiently strong to inject sufficient funds into the space to rehabilitate it for the community of north Kentville.

The problems outlined above suggest that Oakdene has several areas to improve upon. David Paterson suggests that if Kentville were to put more of its budget into Oakdene, it would likely have a positive impact on the property values of the surrounding lots in north Kentville.<sup>10</sup> With higher property values there would be a greater chance of new families moving to the north area of Kentville; there would also be a stronger tax base for the town as well. If the park should receive a larger portion of the town’s recreation budget we recommend the following. The first thing that needs to be done is to improve Oakdene’s signage so that both Kentville residents and visitors to the town can find the park located in the north end of the town. Perhaps if people knew it was there it would get used much more. The second area that requires improvement is the entrances: they need to be cleared and tidied to make it obvious that they are, in fact, entrances to a park. If the park entrances looked a bit more attractive then Oakdene may become more popular among the residents in the area. The third area that needs improvement are the general maintenance details of the park, like fixing the sand around the children’s play park, and painting over the graffiti on the storage shed. With the improvements suggested, which is just general maintenance, Oakdene Park would be a more popular place for residents of Kentville. If Oakdene gets a higher percentage of the population using it, then the it would become more of a community focus, thus making Oakdene a better green space for Kentville.

#### Park Discussion: Participark

Participark is a park located in southwest Kentville, across the street from Memorial Park on Gladys Porter Drive; it also has a second entrance on Grant Street. Participark features 64.4 acres of natural woodland developed by the Kentville Kinsmen Club in an effort to supply the town with an outlet for physical activity and fitness.<sup>11</sup> The area, after substantial work, now includes a two kilometre hiking trail. The park used to have several activity stations which allowed hikers to stop and do different exercises involving different muscles, but these activity stations have since then been removed and the trail system is now mostly used by mountain bikers.<sup>12</sup> The park hosts the annual Kentville Mountain Bike Festival, which shows that the area is now very significant for the bikers.<sup>13</sup> The land was developed in the 1930’s but was not formally opened as a park until September 20, 1981, on the same day as Oakdene’s official opening.<sup>14</sup> Participark, like Oakdene, is another park that seems to be forgotten green space.



Figures 4 and 5: The entrance to Participark on Gladys Porter Drive (left) and (above) Interpretive Signage within the park.

Participark is similar to Oakdene in the way that it is difficult to locate but on the other hand it seems to have a much better upkeep. The entrance to the park on Gladys Porter Drive where parking space is available is essentially unmarked except for the interpretive signage shown above. In the photo above one can also see that the trail is a beautiful one, but needs to improve on some small details. One resident interviewed says that Participark is great place for hiking and walking, but is much underused.<sup>15</sup> Another resident of Kentville did not know that Participark existed. The interpretive signage of the trail is great and was newly installed in 2001, but is out of sight unless one knows exactly where the park is located.<sup>16</sup>

Participark, like Oakdene, requires improved signage so that more people may be aware that the park exists and is developed and maintained. There should be a sign placed on Park Street showing that Participark has an entrance on Gladys Porter Drive. The parking area on Gladys Porter Drive should be marked more clearly. The trails should also be promoted a bit more as well. With proper promotion and added signage the trails would receive the amount of usage that they deserve. One resident suggested that the trails be advertised a bit more, and that some pamphlets should be created to advertise the park.<sup>17</sup>

#### Park Discussion: Memorial Park



Figure 6: The extent of Memorial Park. Google Maps Screen Capture.

Memorial park was founded on 32 acres of orchard and 60 acres woodland which previously belonged to a Herb Dennison. The grounds were chosen because of their natural beauty and central location in Kentville.<sup>18</sup> Also, according to Mabel Nichols, “before 1921 there were no grounds in the town available for athletic purposes. For a time games were played in Aldershot, but the need for grounds nearer the town was very evident.”<sup>19</sup> With a growing population, Kentville was in need of its own recreational space; the park lands being acquired in 1921, doubled as an enduring memorial to the soldiers of the First World War, followed soon after by those of the Second, hence its name. Some grounds were cleared by 1922 when the first baseball field and softball field were marked out. The original playground was added a year later in 1923.<sup>20</sup>

From its creation to the present day Memorial Park has been built up as the outdoor centre of the community. Members of the town council were happy to explain the importance of Memorial to the community. Mark Phillips explained that Memorial has grown with the community and now has 75 to 80 hours of rental time per week in peak seasons. This is almost double the average for parks in smaller towns, like Aldershot, which average 45 to 50 rental hours per week.<sup>21</sup> Currently the park boasts three soccer fields, a track with another field on the turf inside, four baseball fields of varying size, a playground, tennis courts, and a swimming pool. Trees and a stone memorial at the entrance were added in over the years, while pumpkin people, for which Kentville is famous among the Valley’s residents and beyond, adorn the front entrance around Halloween.

The first Apple Blossom festival was organised in 1933, as a reflection and celebration of the Valley’s primary export, apples. According to Nichols the people of Kentville were deeply involved in the festival’s establishment as they petitioned the provincial government for a financial grant.<sup>22</sup> The first parade, including “five bands, fifty floats, decorated cars and calliopean entries” marched through town to end at Memorial park for dancing and merriment.<sup>23</sup> The festival, now approaching its 78<sup>th</sup> anniversary, continues to be a major project for Kentville, and has a separate section in the Town of Kentville Operating Budget; the festival was allotted \$15,500 in the 2009-2010 year, and funding will be increased by five hundred dollars for the upcoming 78<sup>th</sup> event in the 2009-2010 year to total \$16,000.<sup>24</sup> The park’s inclusion in the Apple-Blossom Festival, as well as the yearly visit by the pumpkin people, and the continually increasing seasonal use by the community show that Memorial has made itself an indispensable space within the community’s identity.

One of the main problems with Memorial park is the controversy surrounding its potential vulnerability to flooding. The topic was even discussed by the *Kentville Advertiser* at one point. When interviewed, Mark Phillips and Mark Pearl steadfastly maintained that the park was well above the mandatory height (nine metres above sea level) in the 100-Year Flood-Plan. On the point of the park’s vulnerability to flooding, Mr. Pearl stated, “You shouldn’t believe everything you read in the newspaper, and you can quote me on that!” Although the town council, and their designated analysts, are the only bodies properly constituted to designate the land as either floodplain or not so, they cannot argue against the fact that the east end of the park certainly gathers a surplus of water. This can be demonstrated to have occurred on at least one occasion by Figure 7 below, provided by Frank McFarlane. The picture encompasses the driveway behind the stone monument, and extends into the little league field, tennis courts, and playground. One example does not establish in itself a pattern, but it is probable that this area of the park is susceptible to flooding of this nature on an

ongoing basis. The steeply sloped south bank seen in Figure 8 below does not help the soggy condition as runoff leaches down into the soil along the slope while a portion of it follows gravity down into lower areas of the park. Here the runoff saturates the soil before the floodwater has a chance to be absorbed.



*Figures 7 and 8: (Above Left) flooding at the east end of Memorial Park. Picture courtesy of Frank McFarlane. (Above Right) the topography of the south bank's steep slope contributes to the waterlogging of the park. Picture by Kaitlyn Steele and Alisha Whynot.*

Memorial also faces one other problem: the continually rising expenditure being allotted to this park may be, or soon will be, unable to stimulate further revenue growth. This includes the designated park lands, and the residential areas surrounding it. An agent from MacKay Real Estate indicated to us that there was a direct correlation between the allocation of Parks and Recreation funds for Memorial and Oakdene parks and the pricing of homes around each site. At the time of writing (late Fall 2009) there were nine houses for sale around Oakdene Park at the North end of Kentville. Oakdene only receives \$1000 of expenditure with the chance of gaining an additional thousand dollars for the 2009-2010 year. The houses for sale in the neighbourhood around Oakdene Park range in price from \$39,900 to \$169,500.<sup>25</sup> In comparison “there are 7 homes listed in the Memorial Park area at present, ranging from \$179,900 to \$369,900.”<sup>26</sup> The agent explained that the houses around Memorial Park are also older subdivisions with larger properties. David Paterson made the suggestion that an expenditure in Oakdene would serve as a community investment, by helping to increase the property value. However, by only significantly improving the one major green space encompassed by Memorial Park, the Kentville Town Council is “putting all its eggs in one basket and only facilitating economic growth among some of their residents.”<sup>27</sup> This means that the sizable allowances to Memorial are only providing slight profitable benefit to the town overall, whereas Paterson argues, that diverting one third of that expenditure into Oakdene could add a much more significant increase to the house values in the town's north end.

#### Park Discussion: The Kentville Trail

The Kentville Trail holds a special place in the hearts of many residents of ‘The Devil's Half Acre’. The trail runs along the course of the old rail beds, continuing on into neighbouring municipalities. When the railway and the old rail yards were closed in the 1990's, the rail lines

were abandoned as well. Beginning just east of the town the lines were pulled up, but the rail bed itself remains as 7 kilometres of maintained trail for pedestrians.<sup>28</sup> This trail has its own section in the Kentville budget under ‘rail corridor maintenance’ which is allotted \$3,000.<sup>29</sup> Otherwise it is assumed that the ‘other parks’ subdivision includes any extra expenditure on improvement. However, a number of concerns have been raised about the current state of the trail.

In connection with Memorial, and most interestingly, it is the town’s policy that the part of the Kentville Trail which is inside the town limits should be paved. This is probably a policy that is linked to the construction of a new school near the west end of Memorial Park. The paving is to continue from Memorial Park, past the Shannex development, to Webster Street.<sup>30</sup> This leads to the assumption that the Kentville Trail will be turning into a safe urban walking route for children on their way to and from school. On the other hand, the western section, according to one resident whose property backs onto the trail, is prone to flooding. Paving in this area may be counterproductive, as the impermeable paving could keep water from soaking into the land beneath it. By paving the Kentville Trail, the town council has potentially increased the possibility of flooding in the area. In the same interview, a resident stated that she and her neighbours were creating their own dykes in order to keep the stream and floodwater from seeping into their homes. One of this resident’s neighbours was very upset because the pavement certainly does not help her as she tries to prevent flooding of her property.

Because of the pavement that will soon cover a good chunk of the trail, it cannot be designated a “forgotten” green space in the same way as Participark or Oakdene. Although many residents of Kentville remember the original purpose of the beds, from the closing and destruction of the train station in 1996,<sup>31</sup> younger generations will not mark the space’s historical significance. By now paving over the rail beds, and perhaps giving them some productive use to the town outside of recreational value, the Town Council has begun a process of transformation which can only end in the loss of the trail’s historical significance to the community.

Interestingly, there is one other controversy concerning the Kentville Trail, and that concerns the use of all-terrain vehicles on the trail. Kentville’s Director of Recreation explained that the Town Council stood firm by their decision to keep gasoline-powered vehicles off the trail even though other sections of the trail outside Kentville allowed ATVs to travel along the rail beds freely.<sup>32</sup> Mark Phillips recalled an article from the summer of 2009 where a reckless ATV driver was shot in the back by a man.<sup>33</sup> Upon further research the authors discovered that the shooting was by one Michael Goulden in Shelburne County.<sup>34</sup> Reckless driving, which was noisy enough to drive Mr. Goulden to shoot someone, is precisely the reason the Town Council forbids “juiced” vehicles on the trail.

After the few months of interviews and research a few complaints and problems have turned up concerning the condition of the trail. Firstly, as the trail has become increasingly (even overwhelmingly) popular among the community’s dog-walkers, some fear that what should be an active transportation and exercise route runs the danger of becoming a dog latrine. According to one resident a lack of bio-degradable doggy business bags (which are a relatively low-cost and environmentally friendly investment undertaken by several communities in the area, such as Port Williams and Wolfville), together with the

irresponsibility of pet owners, has made the path a danger to shoes.<sup>35</sup> The aforementioned biodegradable baggies for the forgetful owners would be an invaluable addition for the casual walker. Also it would add to the responsibility of the pet owner as there could be no excuse for leaving pet feces along a public space.

Secondly the lack of resting places along the trail makes it difficult for older residents to enjoy the green space. Benches along the most commonly used part of the route would be beneficial to all. The main argument against any kind of resting space is normally vandalism. However, once in place, the condition of the benches should be left up to the residents and users of the trail. Perhaps an agreement could be made with those peoples who want resting spaces along the trail, if the town agreed to put the benches in, the residents could be responsible for their maintenance and replacement.

Finally, there has been a comment about previously existing signs which were set up to improve the morale of trail users; they noted how far a person had walked by marking kilometres or half kilometres. Perhaps these would be good additions coinciding with benches.

#### Productive Partnership Opportunities: Ducks Unlimited Canada

Ducks Unlimited Canada (DUC) is an organization that sponsors programs that restore, rescue, and preserve wetland habitats around the country. In operation for over seventy years, DUC still feels that wetlands are disappearing much too quickly because of urban settlement.<sup>36</sup> As a non-profit organisation, the charity relies on the donations of generous Canadians and the funding of communities. The organisation also “delivers wetland and environmental education programs to teach Canadians about the wetlands and the need to conserve them.”<sup>37</sup> The website continues with reasons about why educating Canadians is important, such as their water cleaning abilities, ability to reduce drought and flooding, as well as their place as a home to hundreds of species.

The Town of Kentville is doing its part to preserve the wetlands within the municipality. According to an article in DUC’s website, Kentville has received top honours within its population category for the construction of Miner Marsh. “This wetland habitat plays an important role in the local watershed by processing surface run-off, filtering nutrients, recharging the groundwater resource and providing habitat to support waterfowl and other wildlife.”<sup>38</sup> Interestingly, the land was purchased by the DUC organisation, and the provincial government contributed two payments of \$50,000 over the span of two years.<sup>39</sup> Town of Kentville minutes also show that as late as 14 November 2007 the DUC site had prominence in ‘parks & recreation’. By the time of this specific meeting of the Town Council, development on the marsh was fully underway. Development of “trails, interpretive signage, benches, viewing stations, water control structure repairs and tree plantings”<sup>40</sup> were continually progressing into mid-November.

Now the Ducks Unlimited Trail has its own area on the Town of Kentville’s website under the Parks and Recreation section. The site has been designed to be fully inclusive, incorporating wheelchair accessibility, and a walking bridge across part of the pond.<sup>41</sup> The construction of Miner Marsh, and the Ducks Unlimited trail which surrounds it, also brought Kentville its second award of 5 blooms from the ‘Communities in Bloom’ organisation. The bloom awards go to registered communities who compete in actively promoting “tidiness,

environmental awareness, community involvement, heritage conservation, urban forest management, landscaped areas, floral displays, and turf and groundcovers.”<sup>42</sup> Obviously, as can be seen by its receipt of two awards of five blooms in ten years, Kentville is very aware of the importance of conservation and preservation of natural green space.

The Ducks Unlimited site is an additional bonus of restored natural wetland, as well as being a recreational site. Unlike parks within the town proper, the Ducks Unlimited trail will take care of itself for the most part, not needing extra expenditure for upkeep for more than a couple of benches. The addition of this natural habitat was certainly an additional benefit to the town and the people of Kentville. Hopefully it will remain in the minds of the townsfolk and council longer than inner-town parks such as Oakdene and Participark.

### Centennial Arena

Kentville’s Centennial Arena receives a large part of the recreation budget, more than any other place of recreation. Since sometime between 1912 and 1914 Kentville has had its own arena.<sup>43</sup> The first two arenas were both destroyed by fire, and the third arena was demolished in 1967 to make way for the arena that currently exists in Kentville.<sup>44</sup> Centennial Arena was opened in 1967 after a building cost of approximately 200,000 dollars.<sup>45</sup> Recreation Director Mark Phillips suggested that the Arena is a major source of revenue for the town as it gets a number of rental hours each week, which shows another reason why the Arena is so important to Kentville.<sup>46</sup> Centennial Arena has had a number of updates regarding maintenance over the decades. In 1996 the plant was updated, in 1997 the roof was renovated, in 1998 the boards (surrounding the ice) were replaced, in 1999 a new dehumidifier was installed, and in 2000 a new clock was installed.<sup>47</sup> This year the rink also had many new renovations, the Centennial Arena website is advertising improvements made to the dressing rooms, which have all received new paint and new decorating, sponsored from Kentville businesses.<sup>48</sup> Because of the number of updates and the amount of work being done to the arena to make it better, it is easy to see that the arena is a place that is important to the lives of residents in Kentville. The arena continues to be a central recreational space in the Town of Kentville and will continue to thrive because of the amount of upkeep and money that goes into it.

### Conclusions

The town of Kentville expends the majority of its parks and recreation budget into a select few recreational spaces, which negatively affects under-funded spaces within the municipality. With a few budgetary adjustments and a commitment of the town council to identify, fund, and encourage ways to increase participation and revenue sources within less well-known greenspaces, the problem could be easily solved. This, in turn, could generate potential income for the town by increasing the property values (and the tax base) of homes across the community. The Arena and DUC’s project at Miner Marsh should continue to be maintained properly so that the community will continue to take advantage of their accessibility, but Kentville residents need to be reminded that they have more available recreational space than just the Arena and Memorial Park.

<sup>1</sup> Town of Kentville Operating Budget, compiled by the Town Council Members. 2009, 34.

<sup>2</sup> Mark Phillips & Mark Pearl, Interview with Alisha Whynot and Kaitlyn Steele, October 21<sup>st</sup>, 2009.

<sup>3</sup> David Paterson, Interview with Alisha Whynot and Kaitlyn Steele, November 21<sup>st</sup>, 2009.

- <sup>4</sup>Author Unknown, "Oakdene, Participark opening Sunday," *Advertiser*, September 16, 1981, sec. 3A.
- <sup>5</sup> Kentville Parks and Recreation Department Facility Inventory, compiled by the Kentville Department of Parks and Recreation, 2004. 7.
- <sup>6</sup> Kentville Facility Inventory, 7.
- <sup>7</sup> *The Advertiser*, September 28, 1978.
- <sup>8</sup> Interview with Mark Pearl.
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- <sup>10</sup> Interview with David Paterson.
- <sup>11</sup> Interview with Mark Phillips.
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- <sup>14</sup> *The Advertiser*, September 16, 1981, sec. 3A.
- <sup>15</sup> Kentville Resident, Interview with Alisha Whynot and Kaitlyn Steele, November 25, 2009.
- <sup>16</sup> Facility inventory, 5.
- <sup>17</sup> Interview with Kentville Resident.
- <sup>18</sup> Mabel Nichols, *The Devil's Half Acre*, (Kentville: Kentville Centennial Committee, 1986), 122.
- <sup>19</sup> Nichols, 123.
- <sup>20</sup> Nichols, 123.
- <sup>21</sup> Interview with Mark Phillips.
- <sup>22</sup> Nichols, 153.
- <sup>23</sup> Nichols, 154.
- <sup>24</sup> Operating Budget, 31
- <sup>25</sup> Marianne Pettigrew, MacKay Real Estate, "Your Project", email to Kaitlyn Steele, December 2<sup>nd</sup>, 2009.
- <sup>26</sup> Email with Marianne Pettigrew.
- <sup>27</sup> Interview with David Paterson .
- <sup>28</sup> Town of Kentville, website, parks and recreation.
- <sup>29</sup> Operating Budget, 34
- <sup>30</sup> *Kentville Connection*, Volume 3, no. 2, Fall 2009, pg 7.
- <sup>31</sup> Bria Stokesbury, "Re: Kings County Museum", email message to Kaitlyn Steele, December 3<sup>rd</sup>, 2009.
- <sup>32</sup> Interview with Mark Phillips.
- <sup>33</sup> Interview with Mark Phillips.
- <sup>34</sup> Greg Bennett, "Country Man Charged With Shooting ATV'er," *The Shelbourne County Coast Guard*, October 5<sup>th</sup>, 2009, <http://www.novanewsnow.com/article-384509-County-man-charged-with-shooting-ATV-driver.html>.
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- <sup>36</sup> DUC, About DUC, website, ©November 1996-2009, [www.ducks.ca/aboutduc/index.html](http://www.ducks.ca/aboutduc/index.html)
- <sup>37</sup> DUC, About DUC, website.
- <sup>38</sup> DUC, Archives, "DUC Congratulates Kentville, NS, on Honour," Website, 12 December 2007, <http://www.ducks.ca/aboutduc/news/archives/prov2007/071212.html>
- <sup>39</sup> Kentville Town Council, *Minutes of Meeting of May 17<sup>th</sup> 2007*. Town of Kentville Municipality Archives.
- <sup>40</sup> Kentville Town Council, *Minutes of Meeting of November 14<sup>th</sup> 2007*. Town of Kentville Municipality Archives
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- <sup>43</sup> Nichols, 122.
- <sup>44</sup> Nichols, 122.
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<sup>48</sup> Town of Kentville, "Centennial Arena", 2008, [http://kentville.ca/community\\_recreation\\_arena.cfm](http://kentville.ca/community_recreation_arena.cfm) (accessed December 5, 2009).

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***SECTION 2 – NATURE***

## Chapter 7: Domestic Water Supply and Protection in the Town of Kentville

– *Dorothy Pole and Brynne Sinclair-Waters*

### Introduction

Water is essential for life. Consequently, ensuring access to quality water should be a top priority for any government. The municipal government of Kentville has been successful in making this a priority and has developed a well-managed municipal water system. This paper will demonstrate that Kentville's water system is resilient and well-managed by outlining the development of the town's water system, Kentville residents' water consciousness, and the structure and management of the current water system.

### History

The early history of Kentville's municipal water system is hard to find. Even after researching at the Kings County Museum and making several inquiries at Town Hall, we found very little information from before the 1970s. The limited information we did acquire included evidence that the municipal water system was established in 1866.<sup>1</sup> In 1962, the town established the Kentville Water Commission (KWC) which was mandated to oversee the management and maintenance of the town's water utility. Much more information became available when we began to research beyond this period.

Population growth is one of the major factors which has guided and determined the direction of policy governing the town's water supply. The town has experienced steady growth since the late nineteenth century. Between 1961 and 2001 the town population increased by 898 or almost twenty per cent. It wasn't until this period of growth in the late twentieth century that the population of the town began to put pressure on the town's water supply.

By the late 1970s, concerns were being raised that the town no longer had enough water to supply the its needs. As early as 1976, concerns were being raised that the Kentville water system which relied primarily on McGee Lake, would not sustain the town's population growth.<sup>2, 3</sup> Water was being drawn from McGee Lake which was located on the South Mountain, ten kilometres south of the town limits.<sup>4</sup> The lake had a maximum dry weather flow of one million gallons per day. As the needs of the town, especially the North end, continued to grow, it was estimated that an additional supply of 350,000 gallons per day was going to be needed in order to meet the town's needs through 1995.<sup>5</sup> The water which was being drawn from McGee Lake was no longer enough to provide for the growing population of the town.

In 1976, town policy recommended a major water supply expansion and replacement program. This would require high-level storage sites and consideration of having a well site designated and reserved in the Annapolis Valley Industrial Park.<sup>6</sup> The Industrial Park was established in Kentville in 1975 by the government of Nova Scotia.<sup>7</sup> The provincial government funded the construction of two wells to service the

industrial park.<sup>8</sup> These two wells were eventually turned over to the town in the early 1980s.<sup>9</sup> Even with the addition of these wells to the town water system, population growth was still overwhelming the town's water supply.

Throughout the 1980s and 90s, the need for a new source of water became even more apparent. McGee Lake and the two wells in the industrial park were no longer able to supply enough water for the town. The maximum withdrawal from McGee Lake was 81 million gallons annually and the town was withdrawing 1.2 million gallons a day. Even though the lake was recharging, the town knew they were going to run into problems soon. The lake was not going to get any bigger and there was no way to make it bigger.<sup>10</sup> This shortage was made worse by a drought which hit the area in 1990 and lasted for most of the decade.<sup>11</sup> In the late 1990s, the town was asking residents to conserve their water and refrain from unnecessary use for activities such as washing cars.<sup>12</sup> These events made it clear that a new water source was necessary.

In addition to the stresses on McGee Lake caused by population growth and drought, trihalomethane (THM) levels in McGee Lake and a general trend away from surface water both contributed to a decision to move away from reliance on McGee Lake. In 1999, unacceptable levels of THM were found in the tap water of eighteen Nova Scotian communities, including Kentville. The chemical was formed when organic material in McGee Lake, primarily leaves, reacted with the chlorine used to disinfect the water.<sup>13</sup> High and prolonged exposure to THM had been linked to bladder cancer, however, experts told residents that the exposure levels were not high enough to cause serious concern. Moreover, the higher levels of contamination were recorded at a time of year when leaf build up was more common and when THM levels would be expected to be higher than normal.<sup>14</sup> Even though it was not considered a serious threat to the community, it did contribute to the decision to move away from a reliance on surface water.

In 1999, due to a combination of all these factors, the Town Engineers recommended that the surface water supply be discontinued and replaced by deep water wells.<sup>15</sup> The town did exploration along the old railway line, drilled test wells and found two acceptable locations for wells – one in the West end and one in the East end. They decided to drill the wells in the West end location and the site became known as the Westend Wellfield. The town went ahead with the construction of the new wells and they were completed by 2002.<sup>16</sup>

### The Development of Water Consciousness

Throughout the late twentieth century, Kentville residents' consciousness about water rose. As the town expanded in size and population, the limits of the municipal water system became more apparent. Until the early 1980s, the water distribution system was gravity powered.<sup>17</sup> Without a pump, any development above the sixty metre contour line could not be serviced. This was sufficient until the town began to expand and development beyond this boundary became more likely. The building restrictions placed on this vacant land made the limitations of the municipal water system clear. Town residents, who had an interest in developing land above the sixty metre contour

line, thus had an interest in the management of the municipal water system and its expansion.

Furthermore, in 1982, an incident in nearby New Minas highlighted the importance of responsible management of municipal water. The incident involved a dry cleaning liquid spill at Vail's Dry Cleaning which resulted in the contamination of one of New Minas' wells.<sup>18</sup> The spill was an isolated case and did not affect the Kentville water system, which is completely separate from the New Minas system. It did, however, raise awareness about the vulnerability of water supply. Moreover, it happened just down the road, which made it very real for Kentville residents. Hal Henderson, former Kentville Town engineer said, "It probably won't happen again, but that doesn't mean that there won't be something else happening."<sup>19</sup> Although this was an isolated case, it did raise the possibility that Kentville's water system was vulnerable and highlighted the need for responsible management.

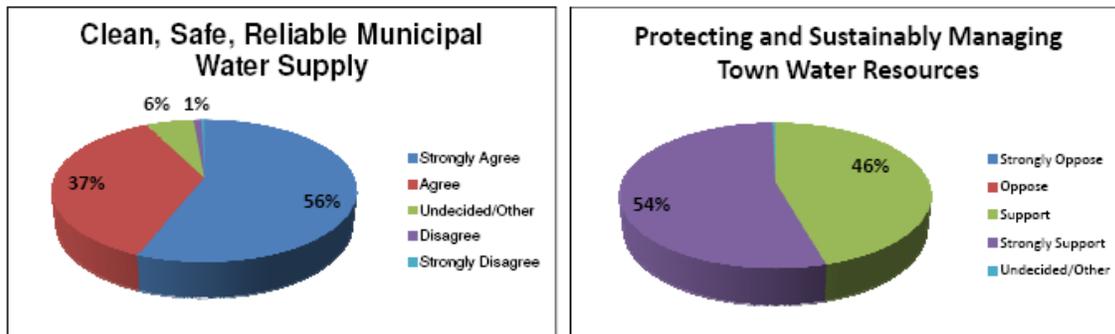
In the 1990s, water continued to be an issue for Kentville residents. The population of Kentville had been rising steadily and the Town's water supply was beginning to feel the pressure. Throughout the nineties, as the area was also hit with a drought, residents were encouraged to consume less water and limit their use of water for unnecessary tasks, such as washing cars.<sup>20</sup> As population growth and drought put pressure on the water supply, the need for an expansion of the water system became increasingly evident.

In 2000, contamination of the water supply in Walkerton, Ontario sparked a national awareness concerning the importance of maintaining safe and reliable water resources. In May 2000, it was announced that *E. coli* had been found in Walkerton's municipal water supply. Due to the contamination, seven people died and hundreds became sick. The contamination was the result of negligent monitoring of chlorine levels and the deregulation of water testing due to cutbacks by the government. The source of the contamination was manure which was spread on a farm near one of the town's wells. The farmer had followed proper practices, but insufficient monitoring and poor planning meant that the water supply got contaminated anyway. The Walkerton crisis resulted in the town expending \$64.5 million dollars on utility repairs alone.<sup>21</sup> Across the country, people became more concerned about their water quality and management.

In response to the Walkerton crisis in Ontario, the government of Nova Scotia began to put more focus on the enforcement of rules and regulation of public water systems. In 2001, the Nova Scotia government implemented an \$850,000 new clean water strategy. The provincial strategy program was meant to ensure the distribution of quality water to the residents of Nova Scotia.<sup>22</sup> The outbreak in Walkerton initiated a deep concern among Canadian citizens about their water systems. Since Kentville was already dedicated to distributing quality water to their residents and had recently begun to undergo major upgrades to their water system, the event did not stimulate the need for any major changes to their system. It did, however, increase concern and awareness about water issues among Kentville residents.<sup>23</sup>

The provincial government continued to focus on clean drinking water and, in May 2008, Leanna Braid, an Environment Department staff member, was part of a team that held various workshops throughout the province to hear residents' concerns about their public water systems. The group toured the province and held fourteen meetings to discuss the matters of public water. The town of Kentville was the sixth meeting and attracted the largest number of participants. This illustrates the degree of awareness and concern Kentville residents had about their water system.<sup>24</sup> This high level of awareness has put pressure on the town to maintain the distribution of safe and accessible drinking water to all residents.

Today, water is a top concern for Kentville residents. In the summer of 2009, a survey was designed by town staff to determine the priorities of Kentville town residents. A clean, safe, and reliable municipal water supply is the top concern for twenty per cent of the 296 residents who responded to the survey. Moreover, fifty-six percent of those who filled out the survey strongly agree that a clean, safe, and reliable water supply is an important priority. Overall, clean, safe and reliable water supply emerged as the number one priority. Furthermore, in the environmental challenges section of the survey protecting and sustainably managing town water resources was identified as the top environmental issue. All of the respondents agreed that it was an important environmental issue and nineteen per cent marked it as the environmental issue that was of greatest concern to them.<sup>25</sup> The survey results clearly demonstrate that a reliable, safe, sustainable, and well-managed water supply is important to Kentville residents.



*Above left: Figure 1 – Clean, Safe, Reliable Municipal Water Supply: Response to the 2009 Community Sustainability Survey question of whether a clean, safe, reliable municipal water supply should be a priority. Above right: Figure 2 – Protecting and Sustainably Managing Town Water Resources: Response to the question of whether protecting and sustainably managing town water resources was an important environmental challenge.*

*Source: Brennan Vogel, Envision Kentville. Phase Two: Community Sustainability Survey Report. Integrated Community Sustainability Planning. September, 2009, pp. 24, 41.*

Current System

The current Kentville municipal water system was completed in July 2002 and cost the town a total of 4.5 million dollars. The system consists of seven wells with two additional wells ready for development in the future. All the wells are located in the Westend Wellfield on Mitchell Avenue; the field encompasses about 500 acres and is located west of Kentville towards Coldbrook.<sup>26, 27</sup> The system distributes 1.2 million gallons of water daily to 2800 residents. The town's government-issued withdrawal

permit allows them to withdraw 1.3 million gallons daily. The well water is treated and balanced to provide medium soft water with low levels of chlorine and fluoride. Overall, the system is able to provide residents with high quality water in more than sufficient quantities.<sup>28</sup>

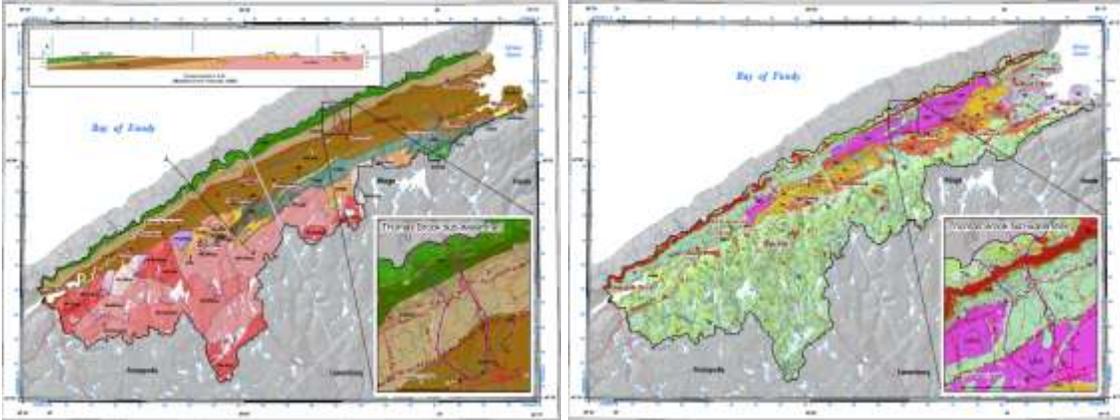
### Water source

Kentville's water system is solely reliant on groundwater because the town's water is drawn from wells. Although McGee Lake is still considered a secondary water source for the town, all of the water currently running out of the taps is groundwater.<sup>29</sup> Groundwater is an important source of water for the province of Nova Scotia as a whole; many private wells and thirty-two per cent of public water supplies in the province obtain their water from a groundwater source. Groundwater is "formed when rain or snowmelt seeps into the ground where it is stored in the pore spaces of soil or in the cracks or pores of rocks."<sup>30</sup> When the quantities of water in the soil or rock yield enough water to supply a well, the formation is known as an aquifer.<sup>31</sup> Kentville draws its water from two aquifers.

In Kentville, groundwater is extracted from both a surficial aquifer, which is made up of sand and gravel, and a deeper bedrock aquifer, which is made up of sandstone. Usually, groundwater is extracted from bedrock aquifers. In the Annapolis Valley, however, the surficial aquifer is saturated with water because it is located along a major river system in a relatively wet climate.<sup>32 33</sup> This means that Kentville has the unique ability to draw water from two aquifers. Of Kentville's wells, five draw from the sandstone aquifer and four draw from the gravel aquifer.<sup>34</sup> This diversification of water sources could protect the town in case of contamination.

The bedrock aquifer from which Kentville draws is known as the Wolfville Formation. The aquifer extends from just North of Highway 101 to about 600 feet below the Cornwallis and is used as a source of water for many residents outside of Kentville, including the Town of Wolfville.<sup>35 36</sup> This sandstone aquifer is unconfined which means that it lacks an upper confining layer of impermeable soil and rock and is more vulnerable to surface contaminants. Water is stored in the bedrock aquifer for twenty to thirty years before it is extracted.<sup>37</sup> This prolonged exposure to rock makes the water harder and thus less desirable than softer water.<sup>38</sup> Since the Wolfville Formation is regionally extensive and the water is stored in it for a substantial length of time before it is extracted, this aquifer is relatively predictable.

The surficial aquifer, from which Kentville draws the rest of its water, is made up of gravel and is ten to forty feet thick.<sup>39</sup> The superficial aquifer differs from the bedrock aquifer in several important ways. First, it is much more fractionated (see figure 3 and 4). Second, water has not been in the aquifer for as long. Since it is younger, it is softer and is considered to be of a higher quality. Third, since it is closer to the surface it is a more reactive system and is more vulnerable to contaminants. For all of these reasons, the surficial aquifer is harder to model and predict.<sup>40</sup> This makes it difficult to determine safe yields. Despite these difficulties, high yields and high quality water make Kentville's surficial aquifer a desirable water source.



Figures 3 and 4. The Wolfville Formation is shown in brown in the figure on the left and is regionally extensive and relatively consistent. The surficial aquifers are shown in the figure on the right and are more variable. Source: C. Rivard, et al., *Canadian Groundwater Inventory: Hydrogeological Atlas of the Annapolis Valley, Nova Scotia*. Natural Resources Canada: Geological Survey of Canada. 2007, pp. 35, 43.

Despite the strengths of this new system, groundwater is not easily managed. In a reservoir you can literally see what you have. Groundwater water sources are much more difficult to monitor and manage.<sup>41</sup> Currently the town withdraws 1.2 million gallons per day and their government-issued permit allows them to draw up to 1.3 million gallons per day which is more than enough water needed to meet their needs. If some kind of problem ever occurred, however, a full permit might not be issued. Since there has not yet been a thorough study of the aquifers from which they draw, it is difficult to predict the future of the water supply.<sup>42</sup> As a result, careful management of the water supply is important so that the perceived security of groundwater does not lead to negligence or overuse.

The shift from surface water to groundwater was a significant step forward for several reasons. First, the groundwater is higher quality than the surface water. It also does not require filtration since the water is filtered as it percolates into the ground. In addition, the wells are able to provide more than sufficient quantities of water to serve the Town. Currently, the town has double the amount of wells needed to meet their need for water.<sup>43</sup>

Despite the sense of security afforded by having access to high quality water in large quantities, further study of the aquifers from which the town of Kentville draws its water would be beneficial to the town. Further study is important so that it can be determined whether water is being drawn from the aquifers in unsustainable amounts. The limited data which has been collected by the town's monitoring wells demonstrates that the water table has risen slightly since data was first collected in 2002.<sup>44</sup> Although this data suggests that the aquifer is recharging at a sustainable rate, further research would be beneficial and enable the town to come to clearer conclusions.

### Storage

When the town shifted from surface water to groundwater, new closed storage facilities were also constructed. This was part of a new trend from open water reservoirs to closed water tanks for storage which made them easier to monitor and less vulnerable to contaminants.<sup>45</sup> The four storage facilities include tanks on Industrial Park (600,000 gallons), Prospect Avenue (1 million gallons), Chester Avenue (1 million gallons), and Belcher Street (300,000 gallons). Each tank is monitored by the Supervisory Control and Data Acquisition (SCADA), which is a computer-run program used to monitor wells and tank levels for contamination and leakages.<sup>46</sup>

### Testing

The town of Kentville has an extensive system of testing to ensure that the water is clean and safe. Water in the wells is tested twice daily for pH, chlorine, turbidity and chlorine levels. On a weekly basis, samples are tested at the Valley Regional Hospital for the presence of bacteria. In addition, the samples are analyzed annually by an independent laboratory to ensure that it is meeting the standards set by the Canadian Drinking Water Guidelines. Quarterly, the water is also tested for corrosion, aluminum, trihalomethanes, and lead. More thorough physical and chemical testing is done twice a year and identifies levels of over forty-one different substances present in Kentville's water.<sup>47</sup>

### Treatment

Kentville's water is treated to increase its quality. For example, liquid chlorine (Javex 12) is used to disinfect the water. Caustic soda is also injected into the water system to increase the pH level up to approximately 7.5 to 8 which eliminates the hardness of the water.<sup>48</sup> The water is also treated with fluoride to reduce dental cavities, particularly among children.<sup>49</sup> Overall, the water treatment improves the quality of the water and makes it more desirable.

Fluoride treatment, however, is controversial because it has been proven to have negative effects. The fluoride protects against cavities by protecting tooth enamel against the acids that inflict tooth decay. Despite this positive impact, fluoride can also have negative impacts. For children under the age of six, high levels of fluoride intake can result in dental fluorosis which causes white spots and brown stains on teeth. Extensive intake can also result in tooth enamel decay. Moreover, adults consuming large quantities of fluoride can experience skeletal fluorosis, which can result in bones becoming more susceptible to breakage. The Federal-Provincial-Territorial Committee on Drinking Water has implemented a maximum concentration of fluoride at 0.8 to 1.0mg/L. The regulations, however, are susceptible to change and alteration on account of new scientific knowledge.<sup>50</sup> According to researchers, the main protective action from fluoride occurs with its absorption through the teeth rather than ingestion. Furthermore, there is growing speculation that there is a link between the ingestion of fluoride and the occurrence of osteosarcoma, the most common form of bone cancer. Therefore, treating water with fluoride may not be an appropriate way to prevent cavities. The application of fluoride to Kentville's public water may be aiding in the

prevention of cavities, however, the long term repercussions of fluoride ingestion could be detrimental to one's health.<sup>51</sup>

### Land-use Bylaws

Land-use bylaws and zoning have been implemented to protect the Kentville westend wellfield area and to ensure the maintenance of high quality water. These bylaws and zoning guidelines are based on a survey which was conducted by a hydrogeologist on the wellfield site. The survey was able to measure the speed at which contaminants would reach the main distribution wells from sites surrounding the wellfield.<sup>52</sup> The Wellfield Protection Area is made up of four zones which form successive rings around the wellheads. The area within a 330 foot radius of the wellheads is Zone A.<sup>53</sup> In this zone, no development shall be allowed unless it involves the operation of Kentville's Water Commission, existing residential use, or existing public parkland. In the three zones (Zones B, C, and D) outside of the wellhead protection area the development of commercial manufacturing, industrial, and processing operations are prohibited. In order to best protect the water supply, rules and regulation are strictest in those areas nearest the wellheads.<sup>54</sup> The recent application, in March 2008, for the development of a King's Transit facility demonstrates the land-use bylaws' ability to protect the wellfield area. The proposed facility was going to be located in zone D and was going to be used for the maintenance of vehicles. The zoning laws prohibited the development of the facility because its use for motor vehicle repair posed the risk that contaminants such as oil, paint, cleaners and other damaging chemicals might leach into the aquifer in the Wellfield area.<sup>55</sup>

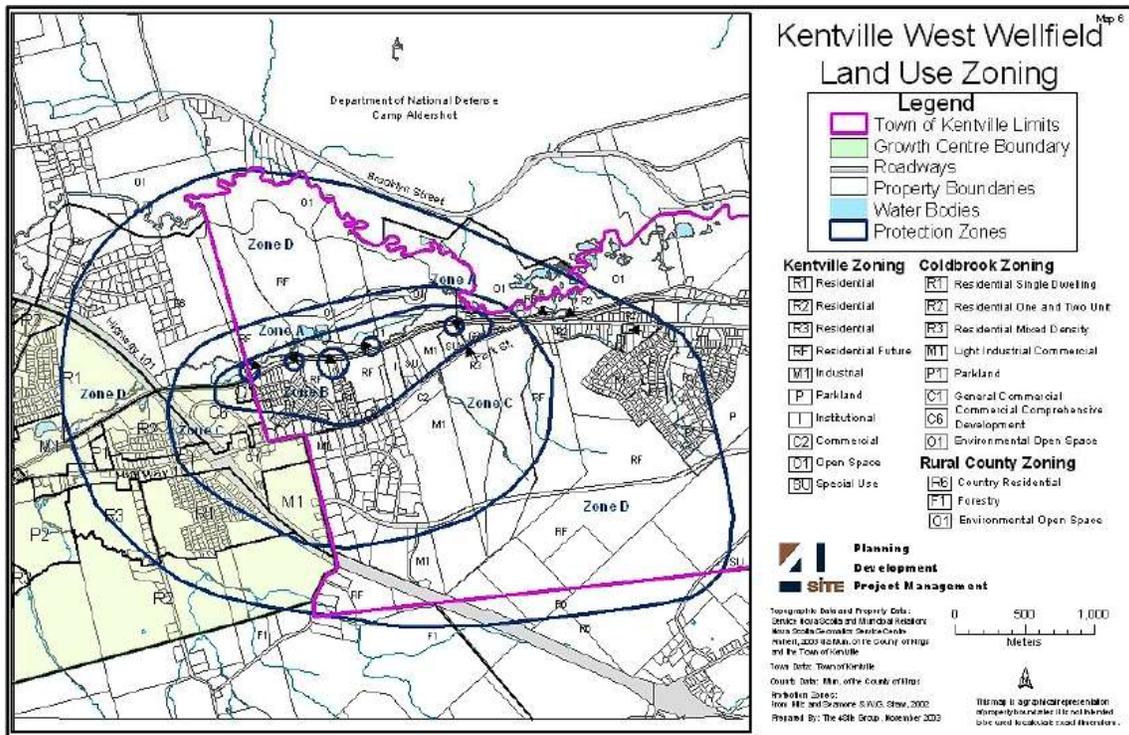


Figure 5 – Kentville West Wellfield Land Use Zoning. Source: <http://www.kentville.ca/documents/water/wellfieldmap.pdf>

### Location

The current wellfield is located on land that was an industrial park and is still used for industrial purposes. Before the wells were drilled and land-use laws put in place, some nonconforming developments were already in place. Although any new developments of this kind would not be allowed, these existing developments were allowed to remain in the area. For example, an Irving fuel storage site is located in the area. Although this is a potential contaminant, it is a new facility which is rubber-lined and closely monitored. There are also some other sites that are nonconforming which include facilities where cars are painted. If there were ever fires at these locations, a danger exists that chlorinated solvents would leach into the aquifer.<sup>56</sup>

Second, the location of the wells makes them more vulnerable because they are all drilled in the same area. If one of the wells is contaminated, the concentrated location of the wells presents added risk to the water supply; it is more likely that several of the sources would be contaminated simultaneously. Moreover, the wellfield is near the highway. Consequently, if there were ever a spill on the highway this would present a great danger to the water supply. Overall, the location of the wellfield makes it more vulnerable because it is concentrated and close to the highway. Despite these drawbacks, the quality and quantity of water available for withdrawal from the aquifer in the wellfield area make it a desirable site for the wells.

### Possible contaminants

There are two types of possible contaminants in any water supply, naturally-occurring contaminants and human-made contaminants. The most common naturally-occurring water contaminants in Nova Scotia include arsenic, chloride, hardness, iron, manganese, radionuclides, radon, sulphate and uranium. Most of these contaminants are related to the make-up of soil and rocks in the area where the well is located. According to data published by the Province of Nova Scotia, Kentville is located on an aquifer where wells are more likely to contain naturally-occurring uranium and arsenic.<sup>57</sup> Recently, as a result of arsenic contamination, residents in the Balster's Eaglewood subdivision decided to switch over to the municipal system as an alternative.<sup>58</sup> Although nearby neighbourhoods have been contaminated, there is no evidence that the municipal system in Kentville has been contaminated with above acceptable levels of any of these contaminants. As long as the water is properly tested, the residents of Kentville do not need to worry about unacceptable levels of these natural contaminants in their water supply.

Another group of possible contaminants is man-made and in Nova Scotia includes primarily nitrates and bacteria from septic fields and fertilizers; chlorides from road salt; hydrocarbons from leaking gas and oil tanks; solvents, such as perchlorethylene (used at dry cleaners and industrial facilities); methane, sulphates and chloride from landfill sites; and pesticides. Of these contaminants, the ones of most concern to Kentville are road salt, mainly from Highway 10, and nitrates, fertilizers and pesticides from farmers' fields. Most of the water that recharges Kentville's wells flows down from the South Mountain. Once the water has reached the flatter area around the

wellfield, the water can flow throughout the area. On the way down the mountain, the water passes under Highway 101 just before it gets to the wellfield. Thus, in the snowy season when the road is salted this poses the threat of salt contamination.<sup>59</sup> In response, the town has reduced the use of salt on the roads in the region surrounding the wellfield, however, the highway is still heavily salted and presents a significant risk. In the area below the wellfield, salt contamination has become a serious problem. Where the land gets flatter, water in the aquifer does not flow as quickly, if at all, so the salt seeps down into the more stagnant water and stays there without being filtered. In the Centreville area, this has caused many well contaminations.<sup>60</sup> Although these incidents of salt contamination do raise alarm bells, the wellfield is not in as high a risk zone as these wells. The wellfield, however, is close to the highway and heavy salt should nevertheless remain a concern. Furthermore, in the area at the bottom of the recharge zone there is a lot of agricultural land, particularly in the direction of Centreville and Coldbrook. It is possible that contaminants from these farms could leach into the aquifer and flow into the wellfield.<sup>61</sup> Overall, due to the recharge patterns, the wellfield's position puts it at greatest risk to contaminants which originate on the south mountain or between the south mountain and the wellfield, such as road salt. Possible contaminants in the flatter area at the bottom of the aquifer, such as farmers' fields, are also of some concern, although it is much less likely that they would flow into the wellfield.

Another potential source of contamination to Kentville's water supply is private wells. There are over 150 private wells that draw from the same aquifer as the Kentville system, many of which are in the Coldbrook area. Each of these private wells represents a potential source of contamination if it is not properly covered.

### Conclusion

The history of the Town of Kentville's domestic water supply and protection becomes important and particularly relevant in the late twentieth century. By the 1970s, the limits of the water system became increasingly apparent. Population growth, particularly between the 1960s and 1990s, and drought in the 1990s put pressure on the water supply and forced the town to expand its water system. This expansion involved a shift from a reliance on surface water to groundwater. The new system has many strengths and weaknesses, but overall it is resilient and well-managed.

The new system's strengths outnumber its weaknesses, however, particular attention must nevertheless be paid to the weaknesses if the Town of Kentville intends to preserve its excellent record of water management and protection. The new system's strengths include a diversified water source (bedrock and surficial aquifer), high water quality, access to large quantities of water, closed storage facilities, thorough testing, sufficient water treatment, and effective land-use bylaws to protect the wellfield. On the other hand, the system's weaknesses include limited knowledge of the aquifers upon which it relies, inherent difficulties in managing and protecting groundwater sources, a concentrated location of the wells, and potential contaminants, particularly road salt. Despite the weaknesses of the new system, the high quality and large quantities of water available to the town create a sense of security. This perceived security should not impair policy-makers' ability to identify and address the weaknesses in the system.

In particular, the challenge of predicting and controlling the movement of water through aquifers should be addressed because it poses a threat to the sustainability of the town's water system. Continued concern about water issues among town residents will serve as the best way to ensure that the Town of Kentville continues to manage its water supply responsibly and does not overlook important issues.

Overall, the town system is resilient and well-managed. If the town continues to address challenges as they arise, such as the potential of road salt contamination and lack of knowledge about the aquifers, the system should remain stable and continue to provide Kentville with clean, safe and reliable water. Excluding the occurrence of a haphazard incident, such as a spill or plane crash, which could contaminate the concentrated water source, the system is sustainable. Even though water is the top concern of Kentville residents, they have little to worry about. In order to maintain the high standards, however, Kentville residents and the Town of Kentville should continue to ensure that their domestic water supply and protection remains a top community priority.

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<sup>1</sup> *Kentville Municipal Development Policy, 1976.*

<sup>2</sup> McGee Lake is often spelled Magee Lake in town reports. We have been informed that the correct spelling is "McGee" Lake by Hal Henderson.

<sup>3</sup> *Kentville Municipal Development Policy, 1976.*

<sup>4</sup> *Town of Kentville: Water Resources Management Plan.* (Hiltz and Seamone Co. Ltd.) May 30, 2000.

<sup>5</sup> *Kentville Municipal Development Policy, 1976.*

This number was based on projected populations of 7000 in 1995 and estimated use of 125.1 gallons/day with a 50% over-supply for back-up.

<sup>6</sup> *Kentville Municipal Development Policy, 1976.*

<sup>7</sup> Hal Henderson(a), interview by author, November 20, 2009, Kentville, Nova Scotia, audio recording.

<sup>8</sup> *ibid.*

<sup>9</sup> *ibid.*

<sup>10</sup> Henderson(a).

<sup>11</sup> Ian Spooner, interview by author, December 3, 2009, Wolfville, Nova Scotia.

<sup>12</sup> Henderson(a).

<sup>13</sup> CBC News(b), "Drinking water cancer scare in Nova Scotia."

[http://www.cbc.ca/news/story/1999/12/14/ns\\_cancerh2o991214.html](http://www.cbc.ca/news/story/1999/12/14/ns_cancerh2o991214.html) (accessed December 3, 2009)

<sup>14</sup> *ibid.*

<sup>15</sup> *Town of Kentville: Municipal Planning Strategy 2001.*

<http://www.kentville.ca/documents/Municipal%20Planning%20Strategy.pdf>

<sup>16</sup> Henderson(a).

<sup>17</sup> *ibid.*

<sup>18</sup> Henderson(a).

<sup>19</sup> *ibid.*

<sup>20</sup> *ibid.*

<sup>21</sup> CBC News(a), "Canada's worst-ever E. coli contamination."

<http://www.cbc.ca/news/background/walkerton/> (accessed December 7, 2009).

<sup>22</sup> Gordon Delaney, "Critics pan clean-water proposal." *The Chronicle-Herald*. Friday, March 30, 2001.

<sup>23</sup> CBC News(a)

- <sup>24</sup> “Nova Scotia Water Future on Tap”. *The Advertiser*. May 2008.
- <sup>25</sup> Vogel, 41.
- <sup>26</sup> Google Maps (accessed on December 3, 2009).
- <sup>27</sup> *System Assessment Report: Town of Kentville, Kings County, Nova Scotia*. (Hiltz and Seamone Co. Ltd.) March 2004, 21.
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- <sup>29</sup> Henderson(a).
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- <sup>41</sup> Spooner.
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## Chapter 8: Severe Weather and Kentville; a History – Catherine Fullarton and Adam Pente

### Introduction

Nova Scotian towns have seen their share of turbulent weather, and the Town of Kentville is no exception. Witnessing hurricanes, floods, and snow storms that have brought whole regions to a standstill, life on the Bay of Fundy has been anything but ordinary. The following chapter will provide an overview of selected major weather disasters which have affected Kentville over the past 140 years, as well as how the town and its inhabitants eventually recovered from these events. In addition we shall examine the evolution of disaster management and planning within the region.

From the long list of natural disasters which have affected Kentville, the following six have been selected as focal points: the Saxby Gale (1869), the “Great Blockage” (1905), the August Gale (1927), Hurricane Edna (1954), the Groundhog Day Storm (1976), and the 2003 spring river flooding. These specific disasters have been chosen from among many for a variety of reasons. First of all, they span a great number of years, from shortly after Confederation to the near-present, and all occurred at an averaged 26 year interval, allowing this study to examine the genesis and evolution of governmental policies and recovery efforts related to natural disasters. They also represent a sample of the wide variety of severe weather events which Kentville has witnessed, allowing for an examination of the way in which Kentville’s response to such events adapts (or fails to adapt) to the great variety of issues it faces. Finally, these events, perhaps more than most others, have worked their way into the collective consciousness and memory of the Town of Kentville (and, in most cases, of the maritime area more generally) as having had a profound impact on the history and character of the region. In selecting them, therefore, it is hoped that a more comprehensive understanding of the history of weather events, and the evolution of the Town of Kentville’s response to them, will be achieved.

### The Saxby Gale – 4 to 5 October 1869

The appearance of severe weather events in collective memory is most apparent with regard to the Saxby Gale, perhaps the most mythologized storm in Maritime history. The gale was named after Lt. Saxby of the Royal Navy, who had written a letter to the editor of the London *Standard* in December 1868, predicting a storm for 5 October 1869.<sup>1</sup> At the time, Saxby’s prediction received little attention; strong gales and hurricane-type storms were not uncommon at that time of year, and Saxby’s prediction had failed to specify *where* in the world it would occur.<sup>2</sup> Nevertheless – and despite the fact that Saxby’s prediction is now held to have been a coincidence<sup>3</sup> – when a storm did materialize, on the evening of 4 October 1869, it was given his moniker.

The storm reached hurricane force by about five o’clock p.m. An hour later, mature trees were being blown over, and by nine o’clock the storm had reached its height.<sup>4</sup> One witness described the storm as follows:

The extreme darkness, the constant roar and tumult of wind, the lashing rain, the groaning of great trees, the hail of debris, shingles, branches, objects large and small, falling everywhere, roofs carried aloft, whole buildings collapsing, all gave a paralyzing sense of insecurity and calamity.<sup>5</sup>

Over the course of the storm, winds averaged 92-148km/hr, and towns all along the Bay of Fundy recorded tides about one foot higher than anticipated, causing major flooding.<sup>6</sup> Though there were few deaths locally, the flooding that accompanied the Gale breached dykes at Grand Pré, flooding thousands of acres of agricultural land, drowning livestock and infiltrating the soil with sea salt. Damage to the apple orchards was minimal, partly because they were located on higher ground which was less prone to flooding, but also because the industry itself was still young. Grain crops were more seriously damaged, however. Bridges and fencing were also swept away along an area about 40km in extent around Kentville, including two of the railway bridges between Wolfville and Port Williams, where “the road bed had crumpled before the tidal wave like sugar.”<sup>7</sup> The railway line also suffered severe damage, and was rendered impassable between Kentville and Grand Pré.<sup>8</sup>

Since the Saxby Gale fell upon the Annapolis Valley in 1869, seventeen years before the Town of Kentville was incorporated in 1886, there are no official records of response at the municipal level. The tragedy also occurred only two years after Confederation, which may explain why no records of any official response from the provincial or federal levels of government were uncovered. One source interprets this lack of evidence and response as indicative of the fact that, at the time, disaster relief was not included in the government’s mandate.<sup>9</sup> According to the evidence examined, it seems that inhabitants of the Kentville area were, for the most part, responsible for their own recovery efforts. Eyewitness accounts from nearby Canning indicate that the inhabitants did have some warning of the storm’s impending arrival, and had prepared themselves to the best of their abilities;<sup>10</sup> nevertheless, as noted above, the damage was still quite severe.

In terms of coordinated recovery efforts, there was a meeting amongst the dyke holders on 16 October 1869 to discuss needed repairs, at which it was agreed that the total cost would be split amongst those involved, at a price of \$1.50 per acre of land ownership.<sup>11</sup> Overall, the dominant feeling in the following year was one of “discouragement, confusion and financial stress,” as the inhabitants of the area were forced to rebuild and recover from the extensive damages and crop losses.<sup>12</sup> In that time, efforts and funding that could have been spent on improvements in commerce and agriculture were instead invested into the recovery effort, with a resulting delay in regional progress.<sup>13</sup>

The response to the Saxby Gale, therefore, was one engineered entirely by the residents of the region, with no involvement from the newly formed governments or from any organized sectors of society. The expectation seems to have been that responsibility for the cost of repairs to personal property and crop losses would reside entirely with the affected individuals, and there does not appear to be any evidence of expectations that the situation would be otherwise. The response, in the Kentville area, was necessarily *ad hoc*, and did not represent part of a larger framework or plan for natural disaster preparedness or recovery. As will be seen, this dynamic of local residents’ mobilization, with very little involvement from government offices,

would be repeated for several decades before a more coordinated approach would be orchestrated by public policy.

#### “The Great Blockage” – January-February 1905

In late January 1905, snow began to fall across Nova Scotia and did not stop for almost a month.<sup>14</sup> Snow drifts reaching heights of five metres accumulated in Kentville, and up to seven metres elsewhere in the province, delaying or halting communication and transportation in what would later be referred to as “The Great Blockage.” From Halifax, there were reports of trains being delayed by more than a day in reaching their destinations, and many being cancelled altogether.<sup>15</sup> In some areas of the province, snow drifts along the rail lines piled up to thirty feet high.<sup>16</sup> By early February, the Dominion Atlantic Railway (D.A.R.) lines had been effectively shut down in many regions, including the Kentville area.<sup>17</sup> Unfortunately, this carried serious consequences for the many communities which depended on the D.A.R. to bring in necessary food and fuel, as these became increasingly scarce as days went by without sign of improvement.<sup>18</sup>

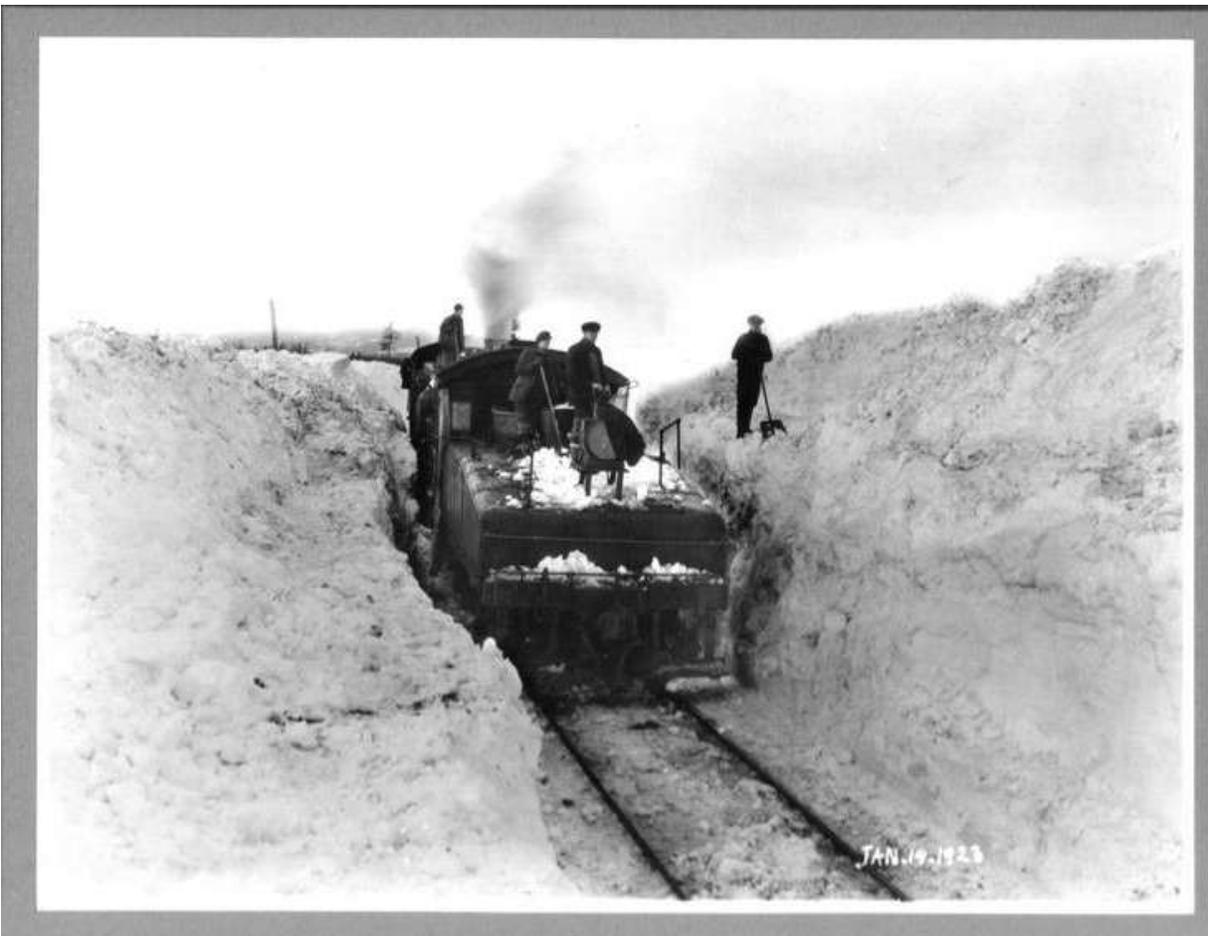


Figure 1 - While this photo was taken of a later winter storm, it does demonstrate the immense snow drifts Kentville and other isolated towns were left to dig out of following the 1905 Blockage. (A.L. Hardy Collection, Courtesy Kings County Courthouse Museum Archives).

Unfortunately little information remains in terms of detailed records of the event in Kentville. In the early years of Town Council, minutes were handwritten, and many are now illegible, so that even if the event had been raised in Council it would be difficult if not altogether impossible to decipher what was discussed. As with the Saxby Gale, no concrete evidence exists in Town Council minutes recording any official recovery efforts initiated or coordinated by the Town of Kentville itself. A state of emergency was called by the province in response to widespread effects of the snow,<sup>19</sup> reflecting some involvement at the provincial level, but whether or not this declaration was accompanied by large-scale recovery initiatives is unclear. The recovery effort involved the “calling out of every able male and arming them with shovels” to dig out and restore the all-important rail lines across the province.<sup>20</sup> One account of this recovery effort notes that the entire student body of Acadia University took up the call to shovels, and helped dig out the rail lines in the area.<sup>21</sup>

Here we see the beginning of provincial involvement in disaster recovery efforts. As with the Saxby Gale, its form was still *ad hoc*, revealing no prior planning or preparation, and it remains unclear to what extent the province would have become involved had the storm only

affected a small region, rather than the province as a whole, but this effort on the part of the provincial government nevertheless marked a turn towards greater government involvement in recovery from natural disasters.

### The August Gale – 24 August 1927

Gale-force winds and hurricane-type storms are certainly not uncommon in Nova Scotia, to the point that “August gales” seem to occupy their own subset in the weather history of the province. One such gale struck Kentville and the surrounding area on 24 August 1927, bringing with it strong winds and rain. In this case, however, what was perhaps most significant was not so much the force of the storm, but rather the fact that it came on so suddenly and without warning – and was over almost as quickly as it had arrived.

The storm began on the morning of 24 August with strong, driving rain that inundated the province, and which lasted until about 9 o’clock that evening.<sup>22</sup> At Kentville, four inches of rainfall were recorded at the Experimental Station.<sup>23</sup> The rain was accompanied by strong winds reaching approximately 65-80km/h which lasted about six hours, from six o’clock p.m. until midnight.<sup>24</sup> The damage inflicted was mainly the result of the winds, which levelled grain fields and destroyed apple orchards. In the case of the latter, the damage cost the industry between 10 and 25% of its crop that year, as well as many mature fruit-bearing trees.<sup>25</sup> Flooding was also responsible for other crop damage, as hundreds of acres of potato crops were drowned out, with losses estimated at up to 25%, and hundreds of bales of hay were carried off down the Cornwallis River and out to sea.<sup>26</sup>

Crops were not the only victims of the storm, however. As with previous disasters, communications were also impaired. Telegraph and telephone poles were knocked out by the high winds, which cut off communication to eastward regions until noon of the day following the storm.<sup>27</sup> Electricity lines had also been knocked down across the region, and power was not completely restored until approximately 10:30 a.m. on 25 August.<sup>28</sup> In addition, a great deal of damage was inflicted on roads and rail lines across the province, especially in the Kentville area. The D.A.R. line was plagued by washouts, as a result of which travel between Kentville and Digby was interrupted and did not resume for several days.<sup>29</sup> Roads in downtown Kentville were flooded, in some cases up to several feet deep, and road surfacing was washed away for a half-kilometre at the west end of town.<sup>30</sup> In Wolfville, Main St. was under approximately 2.5 feet of water. Bridges were washed away, and a dam failed in Kentville, with the latter releasing thousands of tons of water “which swept down over the Flat, carrying trees, rocks, and debris with it,” ruining residential cellars and gardens.<sup>31</sup> Overall, damage to roads was estimated around to be \$500,000 in the Valley alone.<sup>32</sup> Total property losses for King’s County – including crop losses, damage to roads, bridges and railway lines, along with other, miscellaneous damages – were estimated at approximately \$700,000.<sup>33</sup>

Town Council minutes, again, contain no mention of recovery efforts or, indeed, of the storm at all, despite the heavy damage inflicted on the Valley region. This is not to say there *was* no response at the municipal level, but rather suggests that any recovery efforts that were undertaken were, again, *ad hoc* in nature. There is, however, some evidence of prompt responses from particular provincial agencies and private interests. The provincial Department of Highways, for example, acted quickly to secure any available funding which could be directed

towards the estimated \$500,000 of damages to roads in the Valley, and work began immediately, rendering all affected roads “passable” within 48 hours of the end of the storm.<sup>34</sup> The D.A.R. was likewise quick to repair damage from washouts and resumed service within two days, while utilities such as telephone, telegraph, and electric services were completely restored within 24 hours.<sup>35</sup> The all-important apple industry was also quick to recover, and while losses were high, the industry was able to carry on to the next season.<sup>36</sup>

The significance of the event was not lost on Kentville’s then-mayor A.L. Pelton, who later remarked that the effects of the blow on the apple industry reinforced the way in which all other local industries were dependent upon it.<sup>37</sup> And so, while there continues to be a lack of evidence of municipal response or recovery, and while private interests were quick to repair and rebuild their infrastructure in the Kentville area, the aftermath of the August Gale nevertheless demonstrates an improvement in terms of greater provincial response.

#### Hurricane Edna – 11 September 1954

While the damage done to the Valley apple industry by the August Gale produced a noticeable effect on Kentville, its effects paled in comparison to the immense devastation wrought by the ferociously high winds of hurricane Edna which ripped through the area, just prior to the time of harvest. Indeed, as the chapter outlining changes in the agricultural industry of Kentville shows, Hurricane Edna had a profound impact insofar as it underlined the need for greater diversification of industries in order to prevent economic devastation in the event of great losses in one sector.

The weather predictions had accurately forecast the arrival of the storm, but had greatly underestimated its strength.<sup>38</sup> On 11 September 1954, the *Halifax Chronicle-Herald* warned of the impending arrival of “mountainous seas” along the coasts and “gale force winds” in most areas of the province, accompanied by “winds averaging 30 to 35 miles an hour, with gusts up to 50” in the Valley.<sup>39</sup> When the storm hit its peak, just before midnight, the strongest gale recorded at the Greenwood station was more than double that prediction at 102 mph – roughly 163 km/hr.<sup>40</sup>

Most of the damage from hurricane Edna was caused by the intense winds which knocked out trees and downed electrical and telephone poles, blocking roads and damaging property. Damage was worst in the west of the province and in the Annapolis Valley, with early estimates of damage running into several hundreds of thousands of dollars. In Kentville alone, the Town estimated damage to private property at \$100,000,<sup>41</sup> which included some of the 50 barns which were destroyed between Windsor and Yarmouth (of which seven were at Grand Pré).<sup>42</sup> In addition, a transformer on Oakdene Avenue was knocked out by falling trees,<sup>43</sup> and the winds knocked over an apartment building which had been under construction, along with a 75-foot pomace bin at the Canada Foods’ plant.<sup>44</sup>

Wind damage to buildings and property was only secondary to the real damage of the storm, however, and even an entirely accurate prediction of the storm’s arrival would only have been marginally useful for the Kentville residents who suffered the greatest losses. The year had been a terrific one for the region’s apple industry, with what local newspapers described as the best crop in years, and with “good prospects of profitable marketing at home and in the

traditional United Kingdom markets.”<sup>45</sup> Little could be done to prevent or mitigate the damage that Edna would cause to crops and orchards, however, even despite advance warning from storm forecasters. Gravenstein apples were being picked as quickly as possible, but most other apples were not yet ripe. Since pre-emptively picking such apples would yield fruit just as worthless as if it had been storm-damaged, the decision was made to leave them on the trees, and to hope for the best.<sup>46</sup>

The storm struck almost literally on the eve of the harvest, and caused an estimated \$4,000,000 of damage to the apple crops. Crop losses were estimated around 85 to 95% overall, with a monetary salvage rate of less than one-third.<sup>47</sup> As one journalist described it, “The loss was so heavy that it deprived even the most sensational reporters of the chance for exaggeration.”<sup>48</sup> The fishing and lumber industries were also affected, but their losses (and indeed most losses) were eclipsed by the damage done to the apple industry.

Wind damage and the immense devastation to the apple crop across Kentville generated an intense response that included voices from all levels of government. Kentville Town Council minutes again contain little record of official Town response and recovery, however, with only a brief mention of the hurricane, a month later, suggesting that a letter be written to commend the Fire Department for going above and beyond the call of duty,<sup>49</sup> which again suggests that recovery efforts, although numerous, were *ad hoc*. We do know that a local state of emergency was declared,<sup>50</sup> and, as the *Kentville Advertiser* reported on 16 September, that 65 Firemen worked throughout the night of the storm to clear the roads, and were joined the next day by “some 500 volunteers including 125 soldiers from Aldershot Camp.” Electric power and essential services were also quickly re-established.

The disastrous losses inflicted on the apple industry by Edna, however, were of greater concern to Kentville, and relief was much slower in arriving. A meeting was held in the town quite soon after the storm, bringing together residents, industry leaders and representatives from a variety of businesses and government agencies to determine an immediate course of action and to assist in the recovery process.<sup>51</sup> By that time, the apple industry had already taken matters into its own hands, meeting on 15 September to discuss processing fallen apples into sauce and the possibility of creating a “windfall” grade which would still allow for the apples to be sold commercially for juice.<sup>52</sup>

In light of recent federal support that had been offered to Western Canadian farmers, representatives from the apple industry lobbied for both provincial and federal assistance as the only means by which the disaster could be survived, and these efforts were echoed by numerous editorials in *The Advertiser* and in *The Halifax Chronicle-Herald*, which placed responsibility on the government, and which called on it to provide assistance.<sup>53</sup> The federal government responded by suggesting to the provincial government that it request that the Canadian Disaster Relief Fund Incorporated survey the damage, and Prime Minister Louis St-Laurent also released one thousand troops to Valley area farmers to help pick the fallen fruit before it was lost to rot.<sup>54</sup> While the Relief Fund did eventually allow for a 90-cent-per-bushel assistance price, that price was offered only on sound fruit, and by the time it was implemented many of the bruised apples had begun to rot, limiting the amount farmers could claim.<sup>55</sup>

The recovery efforts that followed Hurricane Edna thus continue the trend of *ad hoc* local response, but also demonstrate the gradual emergence of provincial and federal government responsibility and aid in times of crisis, which began after the Second World War. The municipal government was quick to respond, following the storm, and, supported by military forces, was able to mitigate some of the damage to the Town. The apple industry was also successful in receiving both financial and physical aid from the provincial and federal levels of government to help it recover from the devastating losses inflicted by Edna.

### The Beginnings of the Emergency Measures Organization

The government assistance provided to the apple industry following Edna is emblematic of the growing responsibility placed upon the federal and provincial governments during the Cold War period. The Emergency Measures Organization (E.M.O.) was the common name of various government bodies at the federal, provincial, and eventually, municipal levels, originally formed through civil defence policies which were implemented during the Second World War and evolved during the Cold War.<sup>56</sup> Its early mandate was related to civil defence initiatives – including preparing the public for surviving a nuclear war and hopeful recovery – rather than general disaster relief efforts, however.

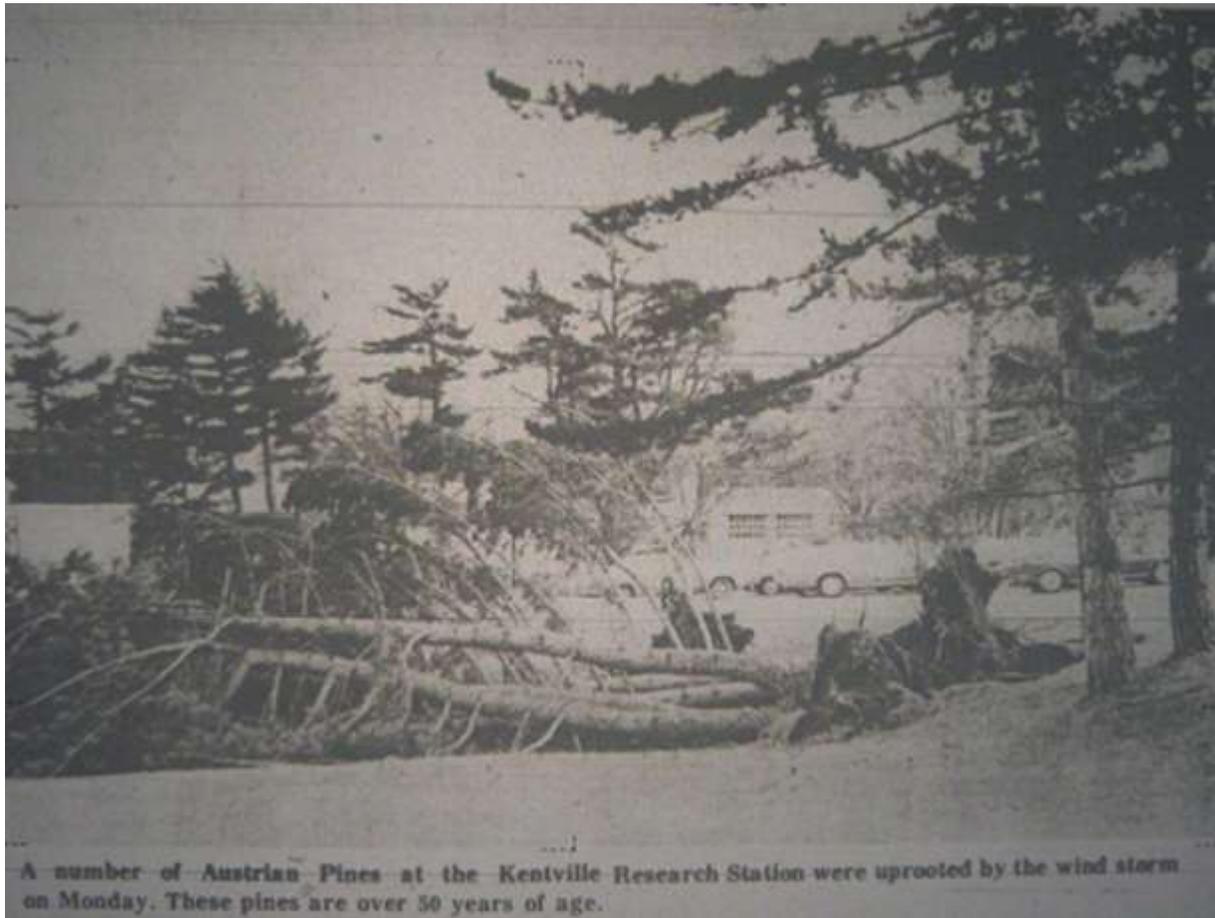
The system was decentralized, with federal and provincial levels responsible for planning, training and coordinating while local governments were left with the implementation of the programs.<sup>57</sup> There are several brief mentions of the Civil Defence Organization (C.D.O.) in the Town Council minutes over the course of the 1950s, but, predictably, they deal solely with preparing the residents of Kentville for the effects of a possible nuclear exchange with the Cold-War enemy USSR, through public exercises, and there is no evidence any consideration of applying this planning to future natural disasters. Furthermore, the sporadic and limited mentions of the C.D.O. throughout the Council minutes suggest it held a much lower priority in Town business than most other issues.

During the 1960s the organization continued its work of preparing for a potential nuclear attack, and provincial and municipal governments began passing legislation to form their own emergency measures organizations. Kentville created its own E.M.O. to replace the C.D.O. on 27 April 1961, and the organization continued to occupy a similar role and low level of priority within the Council minutes.<sup>58</sup> Cost outlines in the 23 March 1966 minutes divide the funding as 75% federal, 15% provincial, and the remaining 10% falling to the Town. Suggestions soon followed, in August 1966, to amalgamate the Kentville E.M.O. with those of the county and of neighbouring towns under one director – a precursor to the modern Regional E.M.O. – and to split the 10% funding cost.<sup>59</sup> An agreement was reached in April 1967, and the Kentville E.M.O. committee was officially dissolved at a Council meeting on 12 April. Over the following year, a federal review of the Canada-wide E.M.O. system “identified the potential to expand the official mandate to include natural disasters,” however this change was not to occur for another 20 years.<sup>60</sup>

### The Groundhog Day Storm – 2 February 1976

Within that 20 year period another great storm, this time a nor’easter, struck the Atlantic region unexpectedly on Groundhog Day, 2 February, in 1976, and as with Hurricane Edna, its

force was felt most intensely in the Kentville area. This time winds measured at the Greenwood Station reached just under 190km/h and lasted 12 hours, much stronger than those recorded during Edna.<sup>61</sup> The high winds were also accompanied by heavy rain and high tides reaching 4ft. above normal.<sup>62</sup> While flooding did not cause extensive damage, as it had in the wake of other disasters, the Cornwallis River and Mill Brook did swell over their banks as a result of the additional rainfall, and with the increased runoff it took several days for the water levels to subside.<sup>63</sup>



*Figure 2 - 50 year old trees, like the above pines at the Kentville Research Station, were snapped like twigs or uprooted entirely by the storm. (Kentville Advertiser)*

As with hurricane Edna, the fishing industry suffered severe losses, especially in the town of Kingsport, and there were also severe damages reported at the Waterville Airport, where a number of small aircraft were damaged, some beyond repair. A number of personal residences were also damaged by the winds, and by falling trees and debris, and a number were completely destroyed. Newspaper reports included several mentions of the large number of mobile homes that were overturned and/or torn from their foundations across the region (see Fig. 3 below).<sup>64</sup> As with previous disasters, the winds knocked down telephone and electricity poles across the Annapolis Valley and some areas remained without power for several days.<sup>65</sup> Coupled with the fact that the roofs and/or walls of many houses and barns had been

destroyed, the lack of electricity raised additional concerns about how residents would cope with the plummeting temperatures that followed the winds.<sup>66</sup>



Figure 3 - Debris is all that is left of this mobile home, utterly destroyed and scattered by the high winds. (*Kentville Advertiser*)

Despite the extensive documentation of recovery efforts following Hurricane Edna, specific evidence of similar local efforts here is strangely scarce. While most details regarding the recovery effort in Kentville are absent from the Town Council minutes, there is, however, a rather interesting mention about them on 11 February 1976. In response to the combination of falling temperatures and power outages, a councillor had organised school bus pickups of affected residents so they could be transferred somewhere warm for the night. Immediately following, then-Deputy Mayor Pope proclaimed that such actions “[show] the need for an effective E.M.O. program” – the first recorded council mention of the need for a preparedness plan.

The *Advertiser* makes many references to various cleanup operations undertaken by emergency services and volunteers across the Kentville area, as well as noting how busy the fire department was during and directly after the storm, but does not provide specific numbers, or names of other agencies involved, or areas affected.<sup>67</sup> What is heavily documented in the paper, however, is the appeal to the provincial and federal governments to provide financial aid to those affected. The suddenness of the storm’s arrival had provided little time for preparations, and had resulted in damages in Kentville expected to be between 1 and 2 million

dollars,<sup>68</sup> with a total cost of 40 and 50 million dollars of damage province wide.<sup>69</sup> Recovery was held to depend upon federal assistance, and was requested by then-Nova Scotia Premier Regan.<sup>70</sup> A meeting was subsequently held between the Nova Scotia E.M.O. and federal departments on 9 February to coordinate damage assessment and allow residents to file claims for uninsurable losses, with an \$800,000 deductible carried by the province.<sup>71</sup>

Despite the strange absence of evidence of specific recovery efforts after the Groundhog Day storm, the available information continues to demonstrate the evolution of disaster response in both Kentville and Nova Scotia. While recovery efforts continued to be *ad hoc*, the levels of provincial and federal assistance in financial aid clearly continued to increase. The development of the relationship between the Nova Scotia E.M.O. and the federal departments from the 1960s to the late 1970s, and the realization at both the federal and municipal levels that effective emergency measure planning should include natural disasters is also indicative of the emergence of modern emergency preparedness planning.

### Kentville, the E.M.O. and the Plan

While the federal government saw the potential of including natural disasters in emergency preparedness planning as early as 1968, and the Kentville Town Council experienced the need for it following the 1976 storm, it was not until the end of the 1980s that action was taken in this regard at any level. In 1988 both the *Emergencies Act* and the *Emergency Preparedness Act* were passed into federal law, repealing the *War Measures Act* and expanding their mandate to include natural disasters.<sup>72</sup> Subsequently, each province passed its own *Emergency Measures Act*, with Nova Scotia's coming into effect on 1 November 1990.<sup>73</sup> Under the "Duties of Municipalities" section, the act required that within one year each municipality must have an emergency measures by-law, an emergency measures organization with proper leadership and staff, and, finally, that it must "prepare and approve emergency measures plans."<sup>74</sup>

Kentville was relatively quick in addressing the requirements of the act. A report on it was prepared by C.A.O. Hardy by 19 November 1990, and discussed at a 23 November Town Council Strategy Session. Hardy stressed the need for "total commitment of both time and money"<sup>75</sup> in preparing the plan, which would:

...establish a predetermined system which will ensure a timely response, coupled with a coordinated, efficient employment of all services to deal with the emergency in the most effective way possible.<sup>76</sup>

Despite this early commitment, the next recorded meeting of the Planning Committee did not take place until 12 December 1992, over two years past the deadline.

Although these types of delays continue unexplained throughout the records of the Planning Committee, and they vastly exceeded their original 5 to 6 month timeline, their work on the plan was quite thorough. They developed a list of potential disasters that *could* strike Kentville and prioritized them based on historical data, changes in conditions, lack of ability to cope with the event, and effects from other areas (see Fig.4 below). Staff members were involved in various training exercises organized and paid for by both the provincial and federal governments. Copies of plans from municipalities as far as Ontario were studied and adapted, and films detailing how other municipalities

have coped with past disasters were studied. The committee also appears to have continuously examined every available option for various facets of the plan, and to have made revisions where problems were identified. It was not until 15 February 2001 that the committee finally completed their Emergency Readiness Plan and prepared to submit it to Council for approval, nearly a decade after the original one year deadline. Fortunately no major disasters afflicted the town during this long planning process, a fact acknowledged at various times throughout the committee planning meetings.

POTENTIAL HAZARD	HISTORICAL	CHANGE IN CONDITIONS	EFFECTS FROM OTHER AREAS	LACK OF ABILITY TO COPE	SUM	PLANNING PRIORITY
Blizzard/Massive Snowstorm *	3	--	--	1	4	2
Chemical Contamination/Spill	--				--	
Hazardous Waste Disposal	--				--	
Drought	1	-1	--	1	1	5
Earthquake	--				--	
Electrical Blackout	1	--	2	--	3	3
Epidemic	--				--	
Flooding *	3	-1	1	2	5	1
Forest/Brush Fire	--				--	
Hurricane *	2	--	--	2	4	2
Major Frost/Freeze	--				--	
Major Hail Storm	--				--	
Major Industrial Explosion	--				--	
Major Water Main Break	2	1	--	--	3	3
Massive Auto Wreck	--				--	
Meteorite Fall	--				--	
Oil Spill	--				--	
Plane Crash	--				--	
Radiation Fallout	--				--	
Severe Fog	--				--	
Tornado	--				--	
Train Derailment	--				--	
Water Pollution	--				--	
Water Shortage	1	-1			--	
Dangerous Goods in Transit	1	1	1	2	5	1
Fire - Major Urban *	3	1	--	--	2	4
Structural Collapse	--				--	

Figure 4 - A copy of the hazard rating chart used by the Kentville E.M.O. Planning Committee to assess the planning priority of potential disasters. (Kentville E.M.O. Records, Town Hall Municipal Archives)

The final adoption of the plan in September 2001 at long last provided Kentville with a detailed, thorough and adaptable strategy for dealing with future disasters, natural or not. It contained clearly defined terms, goals and aims, as well as detailed responsibilities of individuals and town services in the event of a variety of disasters deemed relevant to Kentville. Each disaster outline contained a prioritized list of effects, possible actions in response, and needed equipment. Clear communication networks were laid out to warn the public, assemble essential personnel and community volunteers, and coordinate relief efforts, with contact numbers listed for staff and any public and commercial services available to the Town. Perhaps most importantly, the plan dictated that extensive record keeping must be maintained during a crisis, so that a detailed review could be conducted and improvements made once recovery efforts were completed. This feature would prove of great significance in the months following the spring flooding of April 2003.

### Spring River flooding – 31 March 2003

Kentville has long relied upon the use of drag lines and explosives to break up the large ice floes that accumulate in the Cornwallis River and Mill Brook over the winter, in an effort to prevent widespread flooding when the seasonal temperatures begin to rise. This strategy is normally quite effective, but the spring thaw of 2003, with its unusually high levels of precipitation, proved the modern exception to that rule.

The flooding began on 31 March 2003, as a result of heavy rains of up to 5 inches accompanying the spring thaw, which was already causing rivers and creeks to swell over their banks.<sup>77</sup> The day before, a new record for precipitation had been set when 36.2mm of rain was recorded at the Greenwood station, exceeding the previous record, set in 1969, by more than 15mm.<sup>78</sup> By 10 a.m. the following day, Greenwood had recorded 59mm of rainfall, with another 10mm expected.<sup>79</sup> The rain combined with the seasonal swell of the rivers due to the spring thaw to create water levels far above what could be absorbed by the soil. The resulting flooding affected roughly 1,000 buildings<sup>80</sup> and over 13,500km<sup>2</sup> of land,<sup>81</sup> as well as over two hundred roads and forty-seven bridges which were severely damaged or destroyed.<sup>82</sup> Twenty different roads in King's County were covered with anywhere from four inches to several feet of water, and several highways were closed by the Department of Transportation due to flooding, with damages estimated at around \$10 million.<sup>83</sup> It was expected that the damages would take weeks, even months to repair.<sup>84</sup> As in previous disasters, much of Kentville lost electricity, but in this instance it was the result of electricity being shut off as a safety precaution when the flood waters reached an electrical transformer.<sup>85</sup>

A total of 170 people were displaced across the Maritimes as a result of the flooding, and by 8p.m. on 31 March, over ten people had registered at the temporary shelter set up at the Kentville Fire Hall. That number was low relative to the hundreds of evacuees, possibly because many residents had opted to stay with friends or relatives rather than at the shelter.<sup>86</sup> Thankfully there were no lives lost in Kentville, although 2 people did drown elsewhere in Nova Scotia when their car was swept away by the rising waters.<sup>87</sup>

The flooding also caused other forms of damage to residences and businesses in the Kentville area. One of the main non-flooding problems was that in some areas the

overwhelmed storm sewers overflowed, causing untreated sewage to flow back into homes and onto roads and properties.<sup>88</sup> Fuel from furnaces also leaked out and mixed with the flood waters, contaminating a number of properties in the Kentville and New Minas areas, in one instance devaluing a residential home by \$50,000 as well as burdening its residents with the high costs of the necessary testing and cleanup.<sup>89</sup> For the most part, however, damage was limited relative to that caused by previous storms.

Due to the relatively recent occurrence of the flood and the detailed record keeping required by the 2001 Emergency Measures Plan, there are extensive records of local recovery efforts and a debriefing of the plan's performance. The first change from previous disasters examined above is that the residents of Kentville received several warnings about the possibility of a flood by 28 March 2003; however these were general flood warnings and failed adequately to prepare the residents for the flood's true strength – indeed, the debriefing makes mention that the flood was part of a “1 in 100” storm that far exceeded any previous flooding or expectations.<sup>90</sup> As the waters began to rise in Mill Brook in the early hours of 31 March, the emergency measures plan was activated, and the Emergency Operations Centre within the Fire Hall was opened. The Kentville E.M.O. report on the emergency response details several actions that were taken, following the prescribed “Potential Actions” of the plan. Power was shut off in some areas as the water rose around electrical boxes, while emergency services closed roads and bridges as flood waters made them too dangerous to cross. Emergency services also went door-to-door in threatened and affected areas advising residents of the situation and suggesting evacuation.

Overall, the E.M.O. committee believed their plan functioned very well, but identified shortcomings to be improved on. The main problem identified was a breakdown in communications between the E.O.C. and front line responders and government agencies, leading to confusion amongst both residents and emergency services about what was being done in regards to power disconnections and road closures. Associated with this was the lack of proper identification given to community volunteers and emergency personnel, which both furthered communication difficulties and made it increasingly laborious for residents to know who to contact to receive local information. The third issue was centered on sandbags, as difficulties in filling, storing and deploying them to needed areas and the question of whose responsibility, the E.M.O. or the residents, they truly were. Due to the extensive record keeping by the E.M.O. of the response effort, each of these issues was addressed in subsequent public and private meetings of the Planning Committee to make revision to the plan and improve performance.

In terms of federal and provincial involvement in the response and recovery efforts, the 2003 flood saw the first enactment of the provincial Disaster Financial Assistance Policy, implemented in April 2000.<sup>91</sup> The policy activated once associated costs of recovery exceeded one dollar per capita across the province, approximately \$935,000 at the time of its writing. Home owners and small businesses could make claims on any uninsurable losses to primary residences or commercial locations in order to bring them back up to habitable standards. Individuals could claim up to \$50,000 with a \$1,000 deductible. The policy would prove valuable in the case of the 2003 flood, as many uninsurable damage costs could be subsidized, particularly in regard to the handful of homes contaminated by housing oil during the flood.

## Conclusions

Kentville will never be a stranger to natural disasters; the historical regularity of hurricanes, blizzards, and floods combined with the changing global climate and increasingly severe weather during hurricane season assure this. While provincial and federal support during emergencies has emerged and grown immensely over the past 60 years, the only variable the town can control directly is how its preparedness for crises and plans for prompt recovery can mitigate disastrous effects.

For the majority of the history covered in this chapter, however, Kentville has largely ignored or been ignorant of this fact. The Saxby Gale struck before the town was incorporated, and only two short years after Confederation, and thus a proper governmental response could not be possible, and only the local *ad hoc* recovery effort that did occur could be expected. By the time of the Great Blockage of 1905, there exists the first hints of provincial involvement in mitigate the effects of disasters, although the recovery remained *ad hoc* on the whole and whether or not the province would have intervened as it did had the snowstorm been more localized remains a contentious issue. It is, however, unquestionable that the provincial government took an active approach after the August Gale of 1927, working quickly to both secure funding and repair roadways, although again, the form of response was dictated solely by the disaster with no prior planning. This trend emphasizing *ad hoc* recovery efforts continued through the devastation of Hurricane Edna in 1954, but it is quite important to note the emergence of federal and provincial aid, both through funding and physical assistance, as well as the responsibility to assist placed upon the upper levels of government by the affected public. The recovery from the Groundhog Day storm in 1976 is equally demonstrative of the evolving response to disasters, as co-operation between federal, provincial, and municipal levels of E.M.O. provided financial aid to ease the financial burden of those affect, and the continued reliance on *ad hoc* recovery methods finally sees a shift towards future preparedness planning at both the federal and municipal levels.

As explained above, it was only during the late 1980s and early 90s that the final motion to emergency preparedness planning occurred at the federal level, and only, further still, through provincial legislation that Kentville designed and implemented its own plan. Despite the long delays, the 2001 Kentville Emergency Measures Plan was thoroughly adaptable strategy, receiving 115 points of a possible 116 through provincial E.M.O. reviews.<sup>92</sup> Even acknowledging the shortcomings exposed during the 2003 spring flooding, the plan proved itself by handling the disaster without requiring a state of emergency, while identifying weak areas for revision and improvement.

Thus it appears that Kentville is as prepared as a town could be for future disasters, owing largely to its current Emergency Readiness Plan and the plan's ability to continually be revised due to mandated record keeping and self-review. As we have seen over the discussed timeline of disasters, the plan was the result of a long, slow evolution of how Kentville responded to, recovered from, and finally planned for the natural disasters that will always be a part of its history and its future.

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- <sup>1</sup> A. MacDonald, "Winds of Change: Severe Weather in the Annapolis Valley," (B.A. Hons. thesis, Acadia University, 2006), 30.
- <sup>2</sup> Marilyn Bonvie, "The Saxby Gale of 1869," <http://www.rootsweb.ancestry.com/~nbcharlo/saxby1.htm> (accessed 22 November 2009).
- <sup>3</sup> MacDonald, "Winds of Change," 31.
- <sup>4</sup> Bonvie, "The Saxby Gale".
- <sup>5</sup> *Ibid.*
- <sup>6</sup> MacDonald, "Winds of Change," 27.
- <sup>7</sup> *The Advertiser*, 4 April 2003.
- <sup>8</sup> *Halifax Citizen*, 12 October 1869.
- <sup>9</sup> MacDonald, "Winds of Change," 55.
- <sup>10</sup> Shirley B. Elliott, "The Saxby Gale," *The Journal of Education Novascotianna* XXXIV (1961): 49.
- <sup>11</sup> *Ibid.*, 52.
- <sup>12</sup> Marguerite Woodworth, *History of the Dominion Atlantic Railway* (Kentville: Kentville Publishing Company, 1936), 71.
- <sup>13</sup> *Ibid.*
- <sup>14</sup> *The Halifax Herald*, 27 January 1905; Ed Coleman, "100<sup>th</sup> Anniversary of Big Storm Next Month."
- <sup>15</sup> *The Halifax Herald*, 2 February 1905.
- <sup>16</sup> Ed Coleman, "100<sup>th</sup> Anniversary of Big Storm Next Month," *The Advertiser*, 13 January 2006.
- <sup>17</sup> Ed Coleman, "A Firsthand Glimpse of the 1905 'Great Storm,'" *The Advertiser*, 30 March 2006.
- <sup>18</sup> Ed Coleman, "King's County 'Disasters' Great and Small," *The Advertiser*, 23 March 2003; Coleman, "100<sup>th</sup> Anniversary."
- <sup>19</sup> Coleman, "100<sup>th</sup> Anniversary."
- <sup>20</sup> *Ibid.*
- <sup>21</sup> *Ibid.*
- <sup>22</sup> *The Advertiser*, 25 August 1927.
- <sup>23</sup> *Ibid.*
- <sup>24</sup> *Ibid.*
- <sup>25</sup> *The Advertiser*, 25 August 1927; *The Halifax Herald*, 26 August 1927.
- <sup>26</sup> *Ibid.*
- <sup>27</sup> *Ibid.*
- <sup>28</sup> *Ibid.*
- <sup>29</sup> *The Advertiser*, 25 August 1927.
- <sup>30</sup> *The Halifax Herald*, 27 August 1927.
- <sup>31</sup> *Ibid.*
- <sup>32</sup> *The Advertiser*, 26 August 1927.
- <sup>33</sup> *The Advertiser*, 25 August 1927.
- <sup>34</sup> MacDonald, "Winds of Change," 57-8.
- <sup>35</sup> *Ibid.*, 58-9.
- <sup>36</sup> *Ibid.* 60-1.
- <sup>37</sup> *Ibid.*
- <sup>38</sup> *Ibid.*, 39.
- <sup>39</sup> *The Halifax Chronicle-Herald*, 11 September 1954.
- <sup>40</sup> *The Advertiser*, 16 September 1954.
- <sup>41</sup> *The Halifax Chronicle-Herald*, 13 September 1954.
- <sup>42</sup> *The Advertiser*, 4 April 2003.
- <sup>43</sup> *The Advertiser*, 16 September 1954.
- <sup>44</sup> *Ibid.*
- <sup>45</sup> *Ibid.*

- <sup>46</sup> *The Halifax Chronicle-Herald*, 14 September 1954.
- <sup>47</sup> *The Advertiser*, 16 September 1954.
- <sup>48</sup> *Ibid.*
- <sup>49</sup> Kentville Town Council Minutes, 13 October 1954.
- <sup>50</sup> MacDonald, "Winds of Change," 65.
- <sup>51</sup> MacDonald, "Winds of Change," 63-64.
- <sup>52</sup> *The Advertiser*, 23 September 1954.
- <sup>53</sup> MacDonald, "Winds of Change," 69.
- <sup>54</sup> *The Advertiser*, 23 September 1954.
- <sup>55</sup> *The Advertiser*, 14 October 1954.
- <sup>56</sup> John Lindsay, "Emergency Management in Canada: Near Misses and Moving Targets," Emergency Management Association of Atlantic Canada, <http://www.emaac.net/Reference%20Documents/Near%20Misses%20and%20Moving%20Targets.pdf> (accessed 26 November 2009): 8.
- <sup>57</sup> *Ibid.*
- <sup>58</sup> Town of Kentville Council Minutes, 27 April 1961.
- <sup>59</sup> Town of Kentville Council Minutes, 10 August 1966.
- <sup>60</sup> Lindsay, "Emergency Management," 9.
- <sup>61</sup> *The Advertiser*, 5 February 1976.
- <sup>62</sup> *Ibid.*
- <sup>63</sup> *Ibid.*
- <sup>64</sup> *The Advertiser*, 12 February 1976.
- <sup>65</sup> *The Advertiser*, 5 February 1976.
- <sup>66</sup> *Ibid.*
- <sup>67</sup> *The Advertiser*, 12 February 1976.
- <sup>68</sup> *Ibid.*
- <sup>69</sup> MacDonald, "Winds of Change," 70.
- <sup>70</sup> *The Advertiser*, 12 February 1976.
- <sup>71</sup> *The Advertiser*, 26 February 1976.
- <sup>72</sup> Lindsay, "Emergency Management," 9.
- <sup>73</sup> Nova Scotia Provincial Government, "Emergency Measures Act," <http://www.gov.ns.ca/legislature/legc/statutes/emergmsr.htm> (accessed 14 November 2009).
- <sup>74</sup> N.S. "Emergency Measures Act," section 10, clause (e).
- <sup>75</sup> Kentville Strategy Session, Committee of the Whole, 23-24 November 1990.
- <sup>76</sup> D.L. Hardy, "Emergency Readiness Plan Report," Kentville E.M.O. Records, 1990: 2.
- <sup>77</sup> *The Advertiser*, 4 April 2003.
- <sup>78</sup> *Ibid.*
- <sup>79</sup> *Ibid.*
- <sup>80</sup> *Ibid.*
- <sup>81</sup> Dartmouth Flood Observatory, "Excel xml listing of all floods, 1985-present," Dartmouth Flood Observatory, <http://www.dartmouth.edu/~floods/Archives/2008.xml> (accessed 2 November 2009)
- <sup>82</sup> *The Advertiser*, 4 April 2003.
- <sup>83</sup> *Ibid.*
- <sup>84</sup> *Ibid.*
- <sup>85</sup> *The Advertiser*, 8 April 2003.
- <sup>86</sup> *Ibid.*
- <sup>87</sup> *Ibid.*
- <sup>88</sup> *Ibid.*
- <sup>89</sup> *The Advertiser*, 15 April 2003.

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<sup>90</sup> Kentville E.M.O. Planning Committee, "Flood Debriefing," 23 June 2003: 2.

<sup>91</sup> "Disaster Financial Assistance Policy Announcement," Kentville E.M.O. Records.

<sup>92</sup> *The Advertiser*, 4 April 2003.

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## Chapter 9: The History of the Kentville Floodplain – *Miranda Saroli and Sarah Story*

### The Cornwallis River and Floodplain

The Cornwallis River, which runs through the Town of Kentville, is associated with a floodplain. The Cornwallis River itself may be classified as a meandering river by the manner in which it weaves its way back and forth across its accompanying floodplain. As indicated on a Town of Kentville aerial map (Figure 1) the area outlined in red constitutes the floodplain. The most important thing to note from this aerial map is how the Town of Kentville is situated in relation to this area. However, it was surprising to learn that the definitions of what constitutes a floodplain vary. The definition (from a hydrogeological perspective) of floodplains will be compared to increasingly local definitions from the municipal government to the Town of Kentville itself. The following is the hydrogeological definition of a floodplain:

- “...the strip of land that borders a stream channel, and that is normally inundated during seasonal floods.”<sup>1</sup>

From a municipal perspective, the following describes a floodplain, which is then broken down further into a floodway and a flood fringe:

- (floodplain) “...the low lying area adjoining a water course.”<sup>2</sup>
- (floodway) “...inner portion of a flood risk area where the risk of flooding is greatest, on average once in twenty years, and where the flood depths and velocities are greatest.”<sup>3</sup>
- (flood fringe) “...outer portion of a flood risk area, between the floodway and the outer boundary of the flood risk area, where the risk of flooding is lower, on average one in one hundred years, and flood waters are shallower and slower flowing.”<sup>4</sup>

Finally, the Town of Kentville’s definition of a floodplain:

- “...the area adjoining a river or stream which has been or may be hereafter covered by flood water.”<sup>5</sup>

The greatest contrast is between the hydrogeological definition and the Town of Kentville’s definition in that the former involves a regular flooding of the floodplain, whereas the latter implies that flooding is not necessarily a regular occurrence. In terms of the municipal government’s distinction between a floodway and a flood fringe (important to consider in terms of development), these areas are not described in any way on the aerial map (Figure 1).



Figure 1: Aerial view of Cornwallis River Floodplain, Kentville, Nova Scotia

As evident from the previous discussion, the definitions of what actually constitutes the Cornwallis River floodplain vary. It may not seem significant at this point, but as the history of development of Kentville unfolds throughout the following sections, it becomes clearer as to how these discrepancies (what is considered floodplain and what is not) affect development decisions within Kentville.

Another factor to consider is the changing nature of the river itself. Any river system is attempting to, over time, stabilize itself. This is referred to as the *grading of a river*. A graded river is one that has achieved a slope so that the water flow has enough energy to keep sediment from falling out of suspension, but not enough to erode the channel.<sup>6</sup> In other words, there is no erosion or deposition of sediment occurring in a completely graded river. No river is ever completely graded, however, and the Cornwallis River is no exception to this rule. Therefore, the river will change its shape, in this case meander, in attempts to achieve this optimal slope. When structural changes are made to a river to suit the needs of people, the river may not be able to continue its grading process, influencing water flow. Consequently, changes in the river's ability to flow naturally have an impact on flooding. The following section outlines a brief developmental history of the Town of Kentville, events which directly and indirectly led to structural changes made to this particular section of the Cornwallis River. These developmental decisions are important to consider as a contributing factor when assessing the flooding history of Kentville, past and present. This is an investigation into how the river/floodplain system affects the town, or rather, how the town affects the river/floodplain system.

### Brief History of Settlement

Kentville, that settlement which had developed on the Cornwallis River, at the spot where a great sandbank caused the river to be narrow enough and the banks to be firm enough, to offer safe and easy fording.<sup>7</sup>

Floodplains have been popular places to settle and begin development. However, this has often occurred without consideration of the long term repercussions or knowledge of the natural functions of the floodplain. Historically, land along rivers has offered many immediate benefits such as fertile land for agriculture, water access, irrigation, transportation and sewage disposal which make river regions popular places to inhabit.<sup>8</sup> These environmental conditions have led to settlements on floodplains across Canada, such as in the Red River Valley and along the Saguenay River. Kentville is no exception. Nowadays, the main commercial sector and several housing areas are located on the floodplain of the Cornwallis River. This development is a part of a continuous trend that extends back to the first peoples of Nova Scotia. The location was first used by the Mi'kmaq, who referred to Kentville as “Penook” which means “the fording place.”<sup>9</sup> Its location, at a narrow bend in the valley, made it a convenient crossing point across the Cornwallis River. The site was permanently settled by the New England Planters in 1760, after the Acadian expulsion in 1755, for its ideal location. “Horton Corner,” as they referred to it, provided rich, deep soils and flat terrain for agriculture, sewage disposal and water access for commercial ventures.<sup>10</sup> Many of the Planters built their homes along the south side of the river.<sup>11</sup> Some of these homes are among the oldest in Kentville, dating back to the late 1700's. They are directly located on the floodplain, on streets such as Cornwallis, Belcher, Chester, Oakdene, Park and Main.<sup>12</sup> Development continued at this central and convenient location over time, as Kentville grew into a successful farming centre and later diversified into a bustling commercial and administrative centre, as a result of the industrial revolution.<sup>13</sup>

### The Dominion Atlantic Railway & the Development along the Cornwallis River

On December 18, 1869, The Windsor Annapolis Railway, later known as the Dominion Atlantic Railway, was officially opened, with its main headquarters located in Kentville. However, the railway, which ran from Windsor up the Annapolis Valley to Annapolis Royal, got off to a rough start. In the Saxby Gale of October 1869, the rails sustained great damages when 20 miles of track between Kentville and Horton were flooded.<sup>14</sup> Nevertheless, economic development and commercial interests remained top priority and development continued along the tracks on the floodplain. The heaviest development occurred in what is now the downtown core of Kentville on the south side of the Cornwallis River. Upon completion of Highway 101 in the 1970s and the movement of VIA Rail service to Halifax, D.A.R. usage declined. As a result, all freight and passenger train service ceased and the headquarters and tracks were removed.<sup>15</sup>

In the 1994 Town of Kentville Community Economic Plan Recommendations, the 17 acres of DAR property still remained a development priority, despite historical flooding trends and the acknowledgement in the document of an inadequate emergency measures plan.<sup>16</sup> In the plan it was suggested that this area be used primarily for residential purposes, to “complement the business district and provide a much needed people presence in the downtown after working hours.”<sup>17</sup> This recommendation for development and re-development was made, as a part of a list of the 10 most significant recommendations for Kentville. The main objective of the plan was to try “to attract investors, developers, tourists and citizens to Kentville to expand the economy, the tax base and [the] population.”<sup>18</sup> It is certain that the Town of Kentville felt that the town was “under-developed” at this point in time.<sup>19</sup> However, as Figure 1 clearly demonstrates, this particular location on the Cornwallis River is heavily over-developed on the floodplain. In fact, this once convenient fording place is now one of the most constricted spots along the Cornwallis River as a result of human development. The Cornwallis Street Bridge is

a particularly constraining area as the river here has been trained by developers and now impinges on the ability of the flood plain to retain water, causing heavier flooding both up- and down-stream. This produces a dilemma as the Cornwallis Street Bridge remains the main through-Kentville connector between the north and south sides of the Annapolis Valley. The major issue seems to be that it is out of the Kentville Municipality's jurisdiction and therefore any extension, repair or re-engineering of the site needing provincial funding. The Town recognizes the need to improve this space, and is currently working on acquiring the funding for a new bridge.<sup>20</sup>

### The Training of the Cornwallis River

In addition to the bridge, other structural changes have been executed that affect the natural flow of the Cornwallis River. Sections of the river, those that now pass through the areas of highest development, have been straightened out so that those sections no longer meander. Little information was obtained as to when and why this was carried out, however, it has been proposed that the reason for the training of the river may have been to deal with flooding itself in terms of easing any flow of debris the river may carry (tree branches, ice during the winter, etc.) as well as allowing for the water to move faster.<sup>21</sup> Another possibility for which no information was found and is therefore merely a speculation is that straightening out the bends in the river facilitated development of the town. A river that meanders has erosion occurring on the sides of the channel where water flow is fastest, and deposition occurring on the opposite sides. Erosion of banks causes significant problems in terms of deciding which areas should be developed, so it is possible that this was the reasoning behind the decision of straightening out the river as it allowed for a more stable terrain on which further development could take place. Whatever the reasons the Town of Kentville had for training the Cornwallis River, there were consequences. Straightening the river channel resulted in a shallower channel. During freeze-thaw cycles, these shallow sections of the river have the tendency to freeze straight to the bottom, rather than simply forming a layer of ice on top, typical of deeper channelled rivers. When water from upstream arrives at this frozen area, rather than being able to flow beneath a layer of ice, it is forced up and over the ice. It has been speculated that this change in depth of the river channel directly affects the frequency and size of ice jams, a factor that contributes highly to the degree of flooding.<sup>22</sup> The training of the Cornwallis River is an example of how the Town of Kentville has changed the landscape to suit their social and economic needs.

### A Brief History of Floodplain Management & Development Policy

Although there is still evidence that needs to be consulted, at this point in time, there is some proof that the Town of Kentville began to take the floodplain into consideration when drafting development plans in the 1960s. For example, in 1963, two maps produced by the Town of existing and proposed land use for 1962-1977, indicate specific zones as "liable to flood."<sup>23</sup> However, neither map indicates the real boundaries of the natural floodplain zone. For instance, areas such as the industrial sector located by the D.A.R. tracks are marked solely as development areas and not as "liable to flood." One must question how this may influence the decisions of policy makers regarding future development plans. Maps need to take into account both the human and environmental details if sustainable decisions are to be made. A second point to consider is that these maps, like all the others studied in this research, cut off the Municipality of Kentville along a political border. This creates an incomplete and entirely artificial interpretation of the environment by compartmentalising and even dividing

ecosystems. These imposed borders divide the landscape and can lead to unsustainable or inequitable decision making, which can in turn have economic and social costs for the people in outlying regions.

It was not until 1975 that the Town of Kentville began to consider the “notoriously imprecise” boundaries of the natural floodplain.<sup>24</sup> In a municipal development plan, under the title of “protection,” the need for floodplain regulations and the definition of floodplain boundaries are clearly a top priority. The considerations of these matters, as indicated in the report, resulted from the increased pressure of the Department of Environment.<sup>25</sup> In 1975, the federal-provincial Flood Damage Reduction program was formed “to deliver a consistent, national approach to floodplain management.”<sup>26</sup> However, there seems to have been much more emphasis placed on the need for increased development or the re-development of areas on the floodplain. For example, there was a proposal to extend River Street to West Main Street, and to extend West Main Street as a truck route.<sup>27</sup> Thus the overarching concern was about the use of land in Kentville’s small, compact downtown area, not necessarily environmental protection.<sup>28</sup> The strong desire to keep this location as the central business location was due to minimizing financial costs and inconvenience, but in no apparent way took into consideration the impact on the landscape. However, the fact that there was at least an idea to protect and conserve the environment is a positive sign. According to the *Natural History of Nova Scotia*, in 1978 mapping and identification of flood risk areas did become a growing concern. This was in response to the federal and provincial government agreement directed at implementing better land use policies for flood plains.<sup>29</sup> The mapping is said to have helped Nova Scotia municipalities establish stronger policies and re-think and review future construction on flood plains.<sup>30</sup> Thus, it may be noted that the involvement of federal government in provincial and municipal flood plain practises has had some positive effects at the local level.

In 1980, the Kentville Municipal Planning and Development Department approved a development plan that included an entire section dedicated to environmental protection. This is the first extensive discussion of the floodplain up to this point in time. In the discussion of “the flats,” or the area where Mill Brook empties into the Cornwallis, there is an acknowledgement of the historical flooding problem of the flats. However, it was also admitted that there was very little that could be done to ameliorate the problem of spring flooding. As a result, the council made a conscious effort to restrict development of the floodplain region and implemented Policy F-20. Under this policy, designated areas on the floodplain were to only be used for: “conservation, crop farming, grazing, and pasturage, passive recreational activities, and public or private parks involving no buildings.”<sup>31</sup> However, zoned land that was already in use and which lay below the nine metre contour line would continue to be used and re-developed.<sup>32</sup> Also, the council recognized that a large portion of the area below the nine metre zone, and therefore subject to regular flooding, contained residential development. Two options were put before the council at this point. The first option was to include these regions in the conservation zone (01) and restrict all further development entirely. The second option was to allow development to proceed as long as flood proofing criteria were met. Council decided on the latter and a volunteer committee was appointed to oversee all development of the sensitive areas that would report to and make recommendations to the Planning Advisory Committee.<sup>33</sup> Not included in the plan were the flood proofing criteria that needed to be met.

The 9 metre contour line, which seems to have been established in 1979, still determines how and where development is allowed to occur to the present day. Although the plan states

that a “considerable investigation” was completed that proved that the flooding occurred below the 9-metre mark, it does not state what factors were taken into consideration or who conducted the study. During an interview, Bev Gentleman and Greg Kehoe showed the authors what appeared to be a 30 year old map, which indicated the contours of Kentville. Neither Kehoe nor Gentleman were exactly sure what year the map was developed but assumed that the 9 metre contour was based on “historical information.”<sup>34</sup> According to Bev Gentleman, who serves as the Town’s Director of Planning and Development, if there is a development that the Town is unsure about, the property owner must get a survey to plot the ground levels in order to ensure that the development occurred above the 9-metre mark.<sup>35</sup> The vagueness surrounding the origins of the 9-metre mark suggests that there is reason for concern. Since all development decisions are based on this mark, a more up-to-date geographic study should be undertaken to determine the contour lines’ accuracy. The study should take into account not only flooding on low-lying lands but the impact of increased population and development at higher elevations and environmental changes (climate, water levels, etc.) over time. It is not only the development on the lowlands that affects flooding of homes and businesses but also the development on hillsides of the valley in which the town lies. According to Gentleman and Kehoe, there have not been many permits for development on the lowlands, other than the area around Shannex, so “further development on the floodplain is not a big issue.”<sup>36</sup> They also stated that what is most important, policy-wise, is protecting what already exists.<sup>37</sup> It may be hard to protect what already exists in the future, however, if the paving of the hillsides above the floodplain continues for it impinges on the land’s ability to soak up runoff. For further discussion on this point, the reader is referred to the chapter dealing with storm and surface runoff in this report.



*Figures 2 and 3. Above Left: 3.79 acres of Commercial Property for Sale; new dyke in the backdrop. Above Right: New Shannex development located next to the berm. Photographs by the authors.*

According to Rob de Loe, beginning in the 1990s the federal government let its program “wind down” and flood damage reduction has become an issue for the provinces to contend with.<sup>38</sup> In 1999, the Province of Nova Scotia drafted a Statement of Provincial Interest regarding Flood Risk Areas. In this statement the provincial government recognises “the importance of land and water resources as fundamental to the physical, social and economic health of Nova Scotians.”<sup>39</sup> It is meant to be a guideline for municipalities to help them make more sustainable decisions regarding land use. It is not a rigid set of standards.

The statement mainly applies to five identified flood risk areas in Halifax (two areas), Colchester, Pictou and Antigonish. These areas have all completed a scientific study of the limits of potential flooding which qualifies them as flood risk areas.<sup>40</sup> Although Kings County is not included as a flood risk area, the Statement does recognise that there are other areas subject to flooding and when local information is available, their plans should align with the Statement. As suggested in this brief history, there is considerable historical information and local knowledge available concerning past flood events and the very strong, even overwhelming likelihood of future occurrences, yet from the perspective of an outside observer, Kentville does not seem to be following the provisions of the Statement. For example, the decision to erect the new Shannex senior's center complex conflicts with the Statement which states that even with proper flood proofing, no "residential institutions such as hospitals, *senior citizen homes*, homes for special care and similar facilities [should be built] where flooding could pose a significant threat to the safety of residents if evacuation became necessary."<sup>41</sup> This type of development is not encouraged on either the "flood fringe" or "flood way," which are defined on the first page of this report. Thus claims by Town personnel such as Keith Robicheau, the Chief Administrative Officer of Kentville, that the 10.5 ft high dyke and pumps will work to protect the development on the former DAR lands is irrelevant for the development itself, flood-proofed or not, conflicts directly with the guiding principles of the Province of Nova Scotia, which are meant to encourage environmental, social and economic sustainable development.<sup>42</sup>

### Flood Factors

Floodplains will flood periodically, with periodicity ranging from annual floods to 50 or 100 year floods. The former usually occur during the spring, also known as peak flood season (see Figure 4), due to the pairing of snow melt and ice jams.<sup>43</sup> These are considered regular, predictable flood factors, resulting in less severe flooding. However, if there is more snow than usual or if an early thaw occurs, the situation can become more serious as it is not only less predictable, but the degree of flooding is also higher under these circumstances. Furthermore, the Cornwallis River is tidally influenced which adds yet another level of complexity to the situation. Most importantly, high bi-monthly spring tides in the Bay of Fundy significantly increase the intensity of tidal influence on the river.<sup>44</sup> In addition to the bi-monthly high tides, another less frequent but certainly significant tidal cycle is the Seros Cycle. This occurs approximately every 18 years, results from the orbital influences of the Sun and Moon on terrestrial tides. The Seros Cycle results in a particularly high tide due to the combined influence of two smaller cycles, the Perigean and the Synodic.<sup>45</sup> The Cornwallis River is tidal up to a point approximately 5 km upriver from Kentville (Lovett Bridge) meaning that the entire section of river up until that point is tidally influenced, this section being that which passes through Kentville's downtown.<sup>46</sup> Exacerbating the problem are artificial anchoring points (such as Cornwallis St. Bridge) which constrict the flow of water passing through. This results in upstream flooding as the water level is forced to rise above normal due to the constriction. As mentioned previously, the artificial straightening and consequent depth reduction of the river channel can result in more frequent and/or severe ice jams. Surface runoff from development at higher elevations as well as the use of non-permeable material to reinforce the edges of waterways are both ways in which flooding can be intensified. If all these factors aren't enough, storms are another. Along the East Coast low pressure systems commonly occur, resulting in storm surges which add to the normal high tide.<sup>47</sup> Any of these factors (snow melt, ice jams, early thaw, tidal influence, artificial constrictions, and storms)

combined have the potential to cause a major flood. As is evident from this discussion, the Town of Kentville is considerably susceptible not only to normal but to severe flooding events.

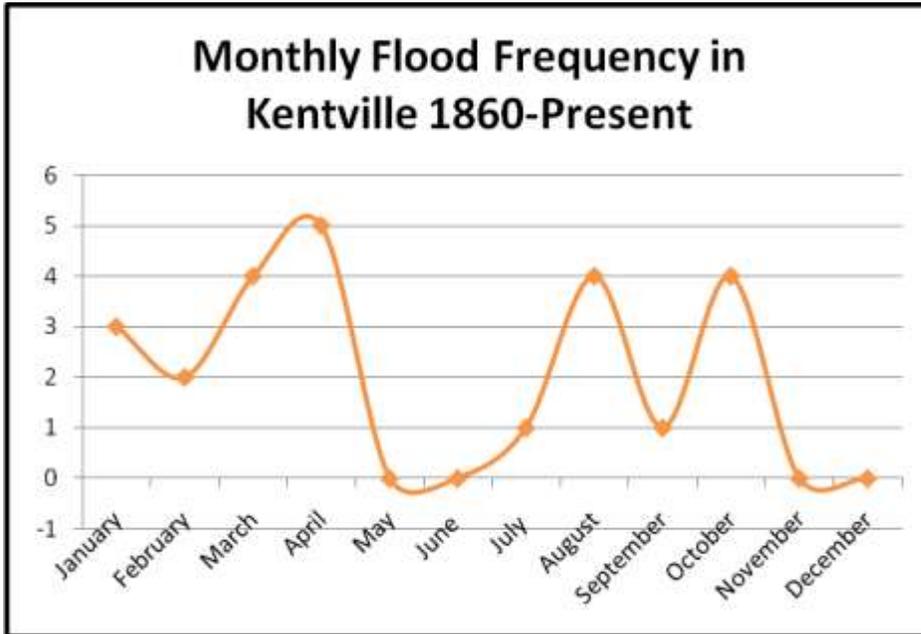


Figure 4: Seasonal nature of severe flood events since 1860. Graphic generated by the Authors.

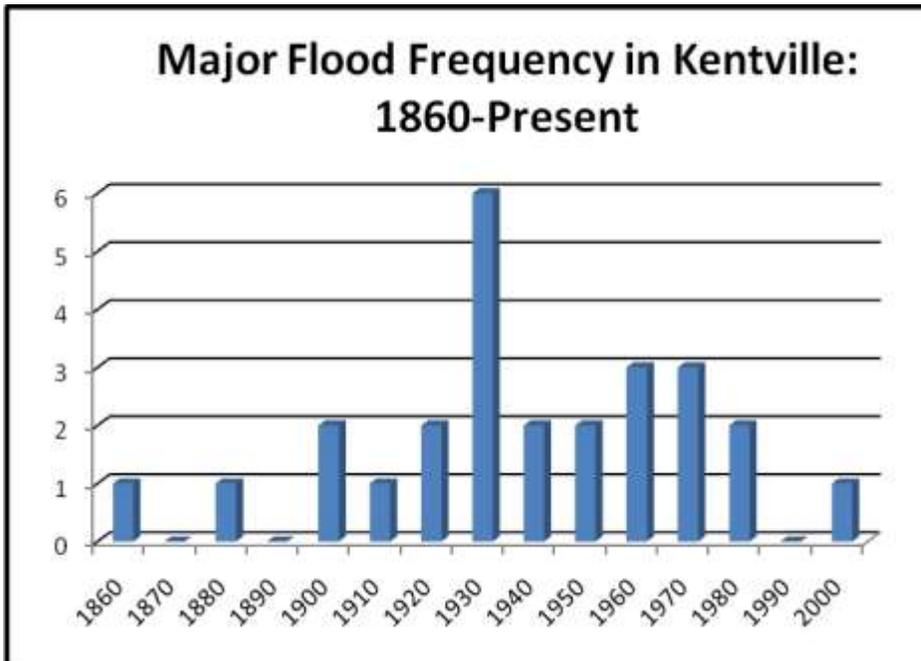


Figure 5: Severe flood frequency per decade since 1860. Graphic generated by the Authors.

Kentville’s Major Flood Risk Areas:

There are three main high risk areas in terms of human development in Kentville that we have identified in our research. These are North Kentville, the West Main Street area, and the “flats” or “flat lands”, the areas bordering Mill Brook and the Cornwallis River. The following

descriptions are some examples of flood events that have occurred in these high risk zones, the flood factors, the community response and the impact on development and the people living there. These incidents are proof that long term preventative measures needed to be seriously considered. Please refer to Figure 5 which indicates the frequency of flooding per decade since 1860.

#### “The Flats”:

On August 15-17, 1971 Hurricane Beth dropped 7.46 inches of rain on Kings County. According the Kentville Research Station, “it was the greatest amount of rainfall in a 36 hour period since 1928.<sup>48</sup> The rainfall caused both Mill Brook and Farm Brook to breach their banks, flooding several streets and basements in lower Kentville.<sup>49</sup> Main Street was submerged by 18-36 inches of water near the Research Station and severely damaged due to erosion as a result of the water washing away the fill.<sup>50</sup> In February of the following year, extensive flooding occurred once again. This time, there were three contributing factors: runoff due to high temperatures, heavy rainfall and ice jams. Harmon Illsley, the former fire chief of 42 years for the Town of Kentville, remembers well the flooding events of 1972. He explains that the runoff from the gully at the top of Mill Brook flushed water and ice downstream, resulting in a major ice blockage which extended from House #42 on Crescent Avenue all the way past the railway bridge.<sup>51</sup> As Illsley said, “when ice moved by the Cornwallis River jammed all hell broke loose.”<sup>52</sup> That year the ice jam was so bad that it had to be continuously dynamited. In later years, however, the use of dynamite would be forbidden because of the impact on spawning fish in the river.<sup>53</sup> Dynamiting, of course, was a measure taken after the fact. The preventative measure was to station a large shovel from Whelton Construction, (operated by Rupert Martin in those days), near the rail bridge for periods of two to three months to keep the river open so ice would flow down the Cornwallis River.<sup>54</sup>

Hope and Wayne Wagner of Crescent Avenue remember the dynamiting. Between the two of them, this couple has a good historic memory for recent flooding events since the 1970’s in the Crescent Avenue area. They have been affected by both major and minor floods since they moved into their home there. “The old story goes that it [the flood] was an act of God,” explains Hope Wagner, “...well, that is one thing...water in your basement is another...”<sup>55</sup> In 1972, crews of volunteer firemen were brought in to help carry people to safety and to pump out basements. Hope and Wayne Wagner, who were among the families that were rescued from their homes that day, explained, “Our floods occurred before there was EMO. We don’t know what we would have done without the fire department. They were the biggest help.”<sup>56</sup> There were many community efforts to help during and after the flooding, there was even an oil company who took the motors off the furnaces to save them.<sup>57</sup> “The company was owned by a nice guy, we couldn’t have gotten better service. His men worked very hard and as soon as the water was out of the basements, they were in there to restore the heat.”<sup>58</sup> This sort of community effort was a common theme in the research. It is clear that without the help of dedicated and caring local people to take in flood victims, cook meals for families and perform manual labour, the families would have had an even more difficult time coping with the disasters.

In 1981, there was a major ice jam at the same rail bridge that caused flooding again.<sup>59</sup> On February 3, the flooding began as a result of the combination of an ice jam, heavy runoff due to rain and warm temperatures. In an *Advertiser* article entitled “Three feet of water filled

streets,” Wendy Elliott quotes Ralph Walsh of Crescent Avenue, “I’m 82 years old and I’ve lived on this street all my life...We’ve always had floods, but this is the worst.”<sup>60</sup> What is interesting about the 1981 flood is the apparent change in the course of the flow of the water. “The last flood was just like the river had changed its course. It came right down the street.”<sup>61</sup> According to locals, this may have been partially due to the fact that years ago the course of Mill Brook was altered.<sup>62</sup>

The flooding of 1981 had a disastrous effect on this community. Approximately forty residents were forced to evacuate their homes due to high waters.<sup>63</sup> The “one nice thing,” Hope explained, “is that because they were all in the same situation, it brought them together as a community.”<sup>64</sup> On February 8, approximately twenty-five property owners and flood victims held a meeting to discuss preventative solutions and future action.<sup>65</sup> It was suggested by residents that the town prepare an engineering study.<sup>66</sup> In February of that same year, a task force was set up to try to help provide Crescent Avenue residents with relief from future flooding of Mill Brook. The study was to be conducted within 3-4 weeks, and would “bring in some experts in to recommend what solution [they] should adopt.”<sup>67</sup> Two solutions, in particular, were under consideration. One possible solution was to build a retaining wall along the waterway and the other solution was to alter of the course of the stream to prevent a bottleneck.<sup>68</sup> Mayor Wendell Phinney acknowledged that there would be no cheap way of solving the problem but that preventative measures were necessary.<sup>69</sup> However, there many residents, including the Wagners, that say they have a feeling that the Town does not want to spend the time or the money on the problem. “There has always been an argument with the Town; they know we have trouble here. If they spent as much money on work as they did on studies, something could be done.”<sup>70</sup> This is another theme that the research has uncovered. Clearly, the communication between the town and the residents has room for improvement.

Education about the area and the functions of the floodplain is also another vital aspect the town needs to work on improving. While some residents, like the Wagners, have a historic memory for the flooding, not all do – especially newcomers to the region. One resident, who in recent years bought a home on Chestnut Street, showed one of the authors her back yard which borders the river. This individual did not know about the problem with flooding. Each spring the normal flood levels nearly reach the foot of this individual’s lawn. The main concern is the erosion of the river banks on the property but this individual does not know what to do about the problem. There has been no assistance in preventative flood proofing from any level of government or community organisation.<sup>71</sup> This seems to be the case with many homes in the area. Even the Wagners, long time residents, say that they do not get assistance with flood proofing their home, which was built in 1926, long before flood plain management became a concern.<sup>72</sup> “But, how do you move when you have put your life savings into your home?”<sup>73</sup> Residents say that realtors are supposed to tell them about flooding.<sup>74</sup> Wayne Wagner says he has had real estate agents contact him about flooding when they are selling homes in the area. “You can say no...we have no trouble right now...but you don’t know about the future...it feels as though you are sitting on a ticking time bomb.”<sup>75</sup> The Connells, who reside on West Main Street, are another good example of newcomers who were not informed they were buying property on a flood plain in 1982. “We never knew we lived on a flood plain...no one told us, not even the real estate agent...that we were in the 9 metre zone.”<sup>76</sup> It was in 2003 that they learned the hard lessons of not knowing the natural tendencies of the local environment. It is realistic to assume that many residents do not know where the floodplain boundaries are in Kentville for the land has been altered dramatically throughout history.

### West Main Street & Area:

On March 31, 2003, sustained rainfall, high tides and runoff caused major flooding throughout Kentville as a major spring storm swept across the Maritime region.<sup>77</sup> According to news reports, many people in Kentville were forced to evacuate their homes, roads were washed out, sand bags were laid at the last minute around Mill Brook to no avail and a home on Brooklyn Street was nearly swept away as the foundation collapsed under the water pressure.<sup>78</sup> “By the Kentville Agricultural Research Station, flood waters were so deep early Monday morning they reached the window level of a parked car.”<sup>79</sup> To assist in the situation, Red Cross set up a temporary relief shelter at the Fire Department, volunteers of the KVFD helped evacuate residents, EMO and the Town set up an overnight shelter for those who did not have relatives to stay with.<sup>80</sup> Even the Ladies Auxiliary made refreshments for stranded flood victims. It was an all-out community effort to come to the aid of the flood victims. In the aftermath of the flooding, Nova Scotia Power was brought in to inspect all homes evacuated before residents could return.

To show the devastation that one flood can do to a single household, the case of the Connells is worth a second look. At their family home on West Main Street, they had to contend with 6.5 feet of water in their basement in 2003. They explain that they have seen flooding before on this street, but they had always been able to drive through it. However, the 2003 flooding was so great that their neighbour canoed from home to the end of the street to pick them up a generator.<sup>81</sup> Bill Connell mentioned that the KVFD was sent to help pump out many homes along the street but, Michelin had lent him a pump so he could pump out his home. Water was not the only thing that this family had to contend with. When the power was shut off, the pressure build up from runoff caused the old cast iron sewer pipe to blow and raw sewage filled their basement.<sup>82</sup> They were left to shovel, pressure wash and sanitize the mess from the 1.5 ft of sludge effluent in their basement. They also had to contend with major oil contamination in their yard in the aftermath of the flood. During the flood, a neighbour’s wood pile had been swept up against their backyard fence, creating a dam. Oil from the surrounding area accumulated at this dam and when the water levels dropped, the oil was deposited on and soaked into their lawn. 585 tonnes of soil had to be removed and replaced, the drive way had to be dug out, and the flooring had to be jack hammered out and replaced.<sup>83</sup> This process lasted from April 2003 until the end of October. The total cost was \$93,000 to clean up the lot.<sup>84</sup> The Connells were highly appreciative of the aid, and stated that the company did a fabulous clean up job.<sup>85</sup> However, they made it very clear that it was a tiring process as they had to contend with jack hammering and equipment through the spring, summer and fall. “It really affected our quality of life,” explained Cathy. Although the federal government did cover the full cost of the oil contamination, they did not cover the damage from the sewage, nor the cost of replacing the furnace and electrical panels.<sup>86</sup> While insurance covered some of this cost, it did not cover it all. Although they were not allowed to raise their coverage for five years, the Connells felt that the insurance company had treated them very well. Other community efforts made by both The Town and local citizens were also supportive. For example, the Town of Kentville arranged special garbage pickups after the flood, free of charge. Men and boys from the local Mennonite community offered volunteer manual labour to all flood victims to help them clean it up. The Connells are amazingly optimistic, “We did amazingly well considering it all.”<sup>87</sup> Others were not so lucky – damage to homes and businesses was extensive, in fact, some people are still dealing with the effects of the 2003 flooding.<sup>88</sup>

In response to the 2003 flooding disaster, the Town of Kentville commissioned a study and \$750,000 was allotted for the construction of a 10.5 metre high dyke. However, to this date, the construction has not been completed and this is a growing worry to local residents.<sup>89</sup> So far, state the Connells, the berm, the pumps, and the new storm sewer that drains water into the river, seem to be helping. Notwithstanding all their troubles, they tell the authors that they “sure feel sorry for the people of North Kentville...” There, they feel, the situation is even worse.

#### North Kentville/Meadowview:

Meadowview, which is located within District 3 of the Municipality of the County of Kings, was once referred to by the locals as “Yoho.” Apparently, it was an unplanned community that “just happened,” without any planning.<sup>90</sup> Meadowview, Dick Killam, Councillor for District 3 explained, “grew up around the old dump site and the people tended to be poor, and discriminated against. They were seen as uneducated, and unemployed...on ‘the other side of the tracks...’”<sup>91</sup> But over time, Killam noted, it began to grow into a healthier community as the government got rid of the dump, brought in sewer and water systems and erected a community hall.<sup>92</sup> Due to its location on the floodplain, Meadowview has flooded on a regular basis, especially at high tides in the spring.<sup>93</sup> Considerable flooding has occurred there due to a number of factors, including “high rainfall, spring runoff, roadway storm drainage structures, the narrowing of the Cornwallis River, the Kentville Bridge structure and the natural tendency of the Cornwallis River floodplain.”<sup>94</sup>



*Figures 6 & 7: North Kentville in 2008 [not a significant flood year]. Photos Courtesy of Megan Spencer.*

“A lot of money has been poured into getting people back on track after flooding has occurred there,” says Dick Killam. However, this is of little comfort to some residents of North Kentville who say they have little protection against the cost of repair due to flooding – insurance, when it does cover flooding, it is only for a minimal amount and coverage only extends to a maximum number of flood events before the insurance is nullified entirely.<sup>95</sup>

Although they have not had a ‘major’ flood since 2003, Councillor Killam and his colleagues are trying to get a study undertaken that will offer preventative solutions that the

town and county can act upon. He realises that major flooding will happen again, especially with the likely impact of climate change. He believes that the need for action now is crucial as another big flood may occur sooner than expected. “It is important to get people represented and implement long term sustainable strategies,” said Killam.<sup>96</sup> When asked whether or not he believed the new berm erected by the Town of Kentville would affect North Kentville he responded, “Town experts say it will have no impact on this side but I fail to understand how that would be.”<sup>97</sup> On November 11, 2009, the Town of Kentville carried a motion that a flood impact study be done by the Advanced Geomatics Research Group.<sup>98</sup> This study is to include Meadowview and encompasses the river all the way down to Port Williams. From the study, the municipality hopes to get a set of options from which they can pick the least damaging and most cost effective.<sup>99</sup> It was also mentioned that elevation contours be identified during this study.

The municipality has taken measures in the past to ensure that flood proofing is secured and that people wishing to build on flood plains are aware. In Port Williams, explained Councillor Janet Newton, the municipality has required that new construction be built up so that it is elevated above the dyke.<sup>100</sup> “If anyone wants to build on a floodplain, they must have an engineered plan submitted and the builder must sign off that he or she has knowledge that they are building on a floodplain, explained Councillor Newton.”<sup>101</sup> Although it is understandable that the municipality wants to encourage use of the waterfront in Port Williams, again one must consider of issues such as how the type of fill affects the floodplain environment. According to the *Natural History of Nova Scotia*, fill, which has been used to build up developments, can increase the upstream and downstream flooding as it hinders the ability of the floodplain to hold water.<sup>102</sup> To counteract the impact structures, such as concrete slabs used for fill, it is important that there is an increased initiative to increase the ability of the floodplain to retain and control water. The expansion of the Riparian Zone is one economically and environmentally viable solution.

### Cornwallis River Riparian Zone

A riparian zone can be defined as the area adjacent to a waterway that separates that waterway from on-land activity.<sup>103</sup> In the case of the Cornwallis River, the natural riparian zone is a strip of land that runs along either side of the river, and makes up a section of the floodplain. The existence of a healthy riparian zone can have many environmental and economic benefits. Perhaps the greatest function of a riparian zone is its ability to filter agricultural runoff by absorbing excess nutrients and chemicals before they can make their way into the river. According to Agriculture and Agri-Food Canada, riparian zones and floodplains are one and the same:

Riparian areas are the narrow strips of land located along streams, lakes, potholes, springs, or anywhere water regularly flows or stands. **They are also known as floodplains**, shorelines, river or stream banks, wetlands or green zones.<sup>104</sup>

The riparian zone (or floodplain) can act as a sponge, storing water and releasing it at a constant rate allowing for a constant water level. This ameliorates the severity of floods due to the presence of vegetation in the riparian zone which slows down the velocity of runoff during a flood event. As well as offering runoff and flood protection, the riparian zone also offers

erosion protection.<sup>105</sup> Vegetation adjacent to a river will anchor the soil, reducing the rate of soil erosion caused by the water current. This same vegetation provides shade, food, and decreases the water temperature of a river which is especially important for the health of fish and other aquatic organisms during the summer months.<sup>106</sup>

In Nova Scotia, many riparian zones have been altered, often resulting in thinner or narrower zones. This is a consequence of the centralization of agriculture and development around river systems. In Kings County, 58% of agricultural activity is limited to the Agricultural District which, not surprisingly, contains four watersheds, one being the Cornwallis River. The other three are Canard, Habitant, and Pereaux Rivers.<sup>107</sup> This concentration of agriculture along the Cornwallis River has numerous negative effects on the riparian zone, and therefore upon the river itself. When livestock have access to the river's edge, or if crops extend right to the river's edge, this essentially destroys that vital riparian zone. Livestock access will be examined first.

Providing livestock with areas to graze involves the removal of much of the existing vegetation to create a pasture. This removal of soil-anchoring vegetation combined with trampling on the river's edge by the livestock themselves (as they will no doubt use the river as drinking water), results in an increase in soil erosion.<sup>108</sup> It is important to note that soil erosion is a natural process of any river system, but this natural process is being intensified by the presence of livestock along the Cornwallis River. In addition to soil erosion, the trampling by livestock on the river's edge increases the quantity of silt entering the water. This silt will eventually settle on the river bottom, covering the gravel layer that provides a spawning ground for fish, a process referred to as siltation.<sup>109</sup> This silt layer makes it difficult for fish to lay their eggs.<sup>110</sup> If the riparian zone were left intact, increased soil erosion and siltation would be controlled. Furthermore, restricting access of livestock to the water's edge controls problems such as foot rot.<sup>111</sup>



*Figures 8 & 9: Eutrophication occurring due to agricultural runoff into the Cornwallis River (left); increased siltation due to livestock trampling (right). Photos Courtesy of Ian Spooner.*

Another impact of agriculture is waste runoff. Again, by denying the riparian zone's ability to retain excess nutrients and chemicals associated with agricultural runoff, these can flow much more easily into the river resulting in processes such as eutrophication. Eutrophication is the process where agricultural runoff enters a water system, providing an excess of normally limiting nutrients such as phosphorus. Excess nutrients result in algal

blooms which in turn, lower the dissolved oxygen in the water, and result in an unhealthy aquatic environment for fish and other organisms. There is evidence of eutrophication in the Cornwallis River (see Figure 8 above). Low dissolved oxygen is not the only issue involved with agricultural runoff. Fecal contamination of the water is a concern for this area.<sup>112</sup> Water quality tests performed on behalf of the Friends of the Cornwallis River Society have observed fecal coliform counts much higher than the safety level guidelines for consumption, recreation, etc. It comes as little surprise that the Cornwallis River has been named by the NGO Earthwild as one of Canada's most endangered rivers, described as having become "...little more than a farm sewer".<sup>113</sup> Again, if the portion of the floodplain known as the riparian zone were kept intact, these agricultural impacts on bank stability, sustainability of the aquatic ecosystem, water quality, and flood severity would be greatly reduced.

### Friends of the Cornwallis River Society

The Friends of the Cornwallis River Society (FCRS) is a non-profit community based organization concerned with the overall health of the river. They were established in 1994 and since then have worked with other organizations on watershed projects pertaining to the river itself. The FCRS once had greater public involvement, but more recently has fall onto the shoulders of Peter Bagnall who spearheads many of the projects. Scientific expertise is provided by Acadia University's Dr. Ian Spooner, Professor in the Department of Earth and Environmental Science. One of FCRS' more recent projects (2007) was a riparian fencing project whose primary goal was to restore and protect the neglected riparian zone along the Cornwallis River. They approached local livestock producers with attempts to encourage them to create a fence barrier between the area accessed by their livestock and the river's edge. The objective was to leave a minimum 5m setback from the river, creating a riparian zone where it at one time existed. The costs of purchase and installation of fencing were to be shared by the FRCS and the landowners, 40% and 60%, respectively. In addition to the fencing project, crop farmers who owned land along the river were also approached by FCRS with a proposed leasing project which requested that this land be leased for ten years at \$25 per acre, again using a 5m setback from the river. In other words, the cost of protecting 1km of riparian edge for ten years would amount to \$250. The purpose of the leasing project was to re-introduce native tree and vegetation species to the river's edge; again, restoring the riparian zone that once existed there. According to the Kings County Riparian Fencing Nova Scotia Habitat Conservation Fund Final Report (2007), the FCRS had obtained two fencing contracts which allowed for fencing along 2km of stream bank (these were not directly on the Cornwallis River, but on tributaries).<sup>114</sup>

### Concluding Remarks

Researching the environmental history of Kentville's floodplain has allowed for a thorough examination of the history of its development and how it has been altered. The floodplain has shaped the development around it, but development has, in turn, shaped it. The consequences of the latter are revealed in the review of the main flood risk areas in Kentville and the consequent public response toward to the Town of Kentville in search for aid. This call for help from the community must be respected and responded to, whether those people have homes on the floodplain or not. The policy regarding management of the floodplain is flawed due to a lack of knowledge of how the floodplain ecosystem functions today, and up to date environmental factors are not taken into consideration. Mapping of the floodplain itself is an issue that must be

resolved by completing an extensive investigation into which areas in town should be closed to development, as the maps used by Kentville's town planners are not current. Development is seen as a top priority for Kentville and as a result, sustainability issues are not given sufficient weight in policy formulation. This in turn leaves development on the floodplain open to viability questions. It must be understood that for successful development to be implemented, it must be considered from a long-term perspective. Understanding how a floodplain system functions is crucial in the planning process, because such knowledge is valuable not only from an ecological perspective but also an economic perspective. Protection of the riparian zone is an example of a long-term solution that can provide both ecological and economic benefits. Solutions that provide both do exist and it is vital that they are taken into consideration so that the Town of Kentville is able to make appropriate and sustainable management decisions. Finally, communication is key. Communication must be improved between Kentville and the Municipality to bring forward the significance of the Provincial Statement of Interest, which is intended as a sustainable framework and guide for development – a guide that requires adherence. This combination – of long-term sustainable solutions together with meaningful communication amongst the various stakeholders – is what is needed to begin to resolve the floodplain issue that is so critical to the community of the Town of Kentville. It cannot be ignored that people live on the floodplain; regardless of how they got there, they must be considered in any future floodplain management decisions. “Is it good public policy to protect people that who through their own means got onto a floodplain?”<sup>115</sup> The answer is both simple and direct: it is “yes.”

<sup>1</sup> John S. Bridge, *Rivers and Floodplains: Forms, Processes, and Sedimentary Record* (Oxford: Blackwell Publishing, 2003), 491.

<sup>2</sup> Government of Nova Scotia, “Schedule B: Statement of Provincial Interest,” February 1999, <http://www.gov.ns.ca/snsmr/muns/manuals/pdf/mga/mgasch-b.pdf> (accessed November 2, 2009).

<sup>3</sup> Government of Nova Scotia, “Schedule B: Statement of Provincial Interest,” February 1999.

<sup>4</sup> Government of Nova Scotia, “Schedule B: Statement of Provincial Interest,” February 1999, <http://www.gov.ns.ca/snsmr/muns/manuals/pdf/mga/mgasch-b.pdf>.

<sup>5</sup> Town of Kentville, “Land Use Bylaws Section 1.56”, 2001.

<sup>6</sup> Alan S. Trenhaile, *Geomorphology: A Canadian Perspective* (Oxford: Oxford University Press, 2007), 491.

<sup>7</sup> \_\_\_\_\_. “Kentville: The First Hundred Years,” *The Advertiser*, [19-?].

<sup>8</sup> Natural History of Nova Scotia, Vol. 1: Topics: “Fresh Water and Resources,” Nova Scotia Museum of Natural History, <http://museum.gov.ns.ca/mnh/nature/nhns/> (accessed 12 Oct).

<sup>9</sup> Town of Kentville, “Town History,” Town of Kentville, [http://www.kentville.ca/explorekentville\\_history.cfm](http://www.kentville.ca/explorekentville_history.cfm) (accessed 30 Nov).

<sup>10</sup> Planning and Development Department, “Municipal Development Plan,” Town of Kentville, 1979, 9.

<sup>11</sup> Planning and Development Department, “Municipal Development Plan,” Town of Kentville, 1979, 17.

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<sup>13</sup> Planning and Development Department, “Municipal Development Plan,” Town of Kentville, 1979, 9.

<sup>14</sup> L.S. Loomer. “Windsor, Nova Scotia: A Journey in History West Hants Historical Society,” Windsor, 1996.

<sup>15</sup> Clean Annapolis River Project “the Dominion Atlantic Railway,” <http://www.annapolisriver.ca/trainstation.php> (accessed 28 Nov).

<sup>16</sup> Town of Kentville, “Community Economic Development Plan,” (Kentville, June 1994), 6 and 19.

<sup>17</sup> Town of Kentville, “Community Economic Development Plan,” 16.

<sup>18</sup> Town of Kentville, “Community Economic Development Plan,” 5.

<sup>19</sup> Town of Kentville, “Community Economic Development Plan,” 16.

- <sup>20</sup> Town of Kentville, “Kentville Town Council Minutes,” 11 February, 2009.
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- <sup>22</sup> Dr. Ian Spooner, discussion, October 2009.
- <sup>23</sup> Town of Kentville Planning Board, “Kentville Looks Forward,” Kentville, 3 March, 1963.
- <sup>24</sup> Town of Kentville, “Municipal Development Plan,” 41.
- <sup>25</sup> Town of Kentville, “Municipal Development Plan,” 41.
- <sup>26</sup> Rob De Loe, “Floodplain Management in Canada: Overview and Prospects,” *Canadian Geographer*. (Winter 2000), 355.
- <sup>27</sup> Town of Kentville, “Municipal Development Plan,” 49.
- <sup>28</sup> Town of Kentville, “Municipal Development Plan,” 16.
- <sup>29</sup> Natural History of Nova Scotia, 351.
- <sup>30</sup> Natural History of Nova Scotia, 351.
- <sup>31</sup> Town of Kentville, “Municipal Development Plan,” 70.
- <sup>32</sup> Town of Kentville, “Municipal Development Plan,” 70.
- <sup>33</sup> Town of Kentville, “Municipal Development Plan,” 72.
- <sup>34</sup> Gentleman and Kehoe, interview, November 6, 2009.
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- <sup>41</sup> Government of Nova Scotia, “Schedule B: Statement of Provincial Interest,” February 1999, <http://www.gov.ns.ca/snsmr/muns/manuals/pdf/mga/mgasch-b.pdf>. Emphasis added.
- <sup>42</sup> Keith Robicheau, Acadia University, 2 December, 2009.
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- <sup>44</sup> Sherman Bleakney, *Sods, Soils, and Spades: The Acadians and their Dykeland Legacy* (Montreal & Kingston: McGill-Queens University Press, 2004), 221.
- <sup>45</sup> Bleakney, 221.
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- <sup>47</sup> Phillips, 176.
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## ***SECTION 3 – SURROUNDINGS***

# Chapter 10: History of Agricultural Change in the Region – *Dewey Dunnington and Curtis Stanford*

## Introduction

Since European settlement the Annapolis Valley has been synonymous with agriculture. However, the nature and dominance of the industry have gone through a number of changes, the most significant of which occurred following technological, cultural and political developments after World War II. With the establishment of a dominant apple industry and its crash at the beginning of the war, the stage was set for rapid diversification and improvement in efficiency that would permanently change the nature of agriculture in the area. Increasingly, farmers in the Valley were affected by world events beyond their control that often undermined their to make a living.<sup>1</sup> These changes will bring us to the present and future of Kings County agriculture, an important but uncertain issue, especially when considering sustainable planning of a community.

In researching this topic we decided early on that talking to those involved in the industry was the best way to understand the changes that have affected agriculture in the last 60 years. As a consequence, much of our time was spent on interviews, but even with this emphasis time constraints limited the number of people we could include in our research. Our information from written sources is accordingly less complete, however even as we found information in the last few days of our project we were excited that they all divulged the same story that had been told to us by farmers, researchers, and residents. One of these sources was a thesis by Hugh Allison Blackmer, also an outsider to the agriculture of the Annapolis Valley, who concluded his preface by saying: “I feel strongly that I am only beginning to learn about agriculture and about the Valley, and that some of what follows is amateurish and terribly beside the point.”<sup>2</sup> We feel much the same.

## **The Rise of Apples in Kings County**

### Early Beginnings

Farmland in the Annapolis Valley has changed hands since the 17<sup>th</sup> Century, but apples have been a constant. The Acadians planted the first apple trees, and established an extensive dyke system in the Valley. The varieties of apples have changed completely from these first plantings, but since the introduction of French trees the industry grew steadily into the 20<sup>th</sup> century.

In the 18<sup>th</sup> Century England and France were engaged in colonial competition, and consequently Nova Scotia became a pawn in international politics. France conceded possession of the province to the English in 1713 via the Treaty of Utrecht.<sup>3</sup> This eventually led to the expulsion of the Acadian French from Nova Scotia, when in 1755 the British Governor Lawrence issued an order to expel them entirely.<sup>4</sup> and “[f]or five years [after this] the farms of the Acadians lay barren, with the apples continuing to ripen and drop as the seasons passed by.”<sup>5</sup>

Governor Lawrence issued a Proclamation in the *Boston Gazette* in 1758,<sup>6</sup> and a more formal invitation in 1759, “to farmers, merchants and tradesmen of New England [...]”<sup>7</sup> to settle the vacant land. They were joined from 1775 on by a second wave of immigration from New England, referred to as the Loyalists. The push factor of hostility after the American Revolution, coupled with the image of safety and familiarity in Nova Scotia drew Loyalists to settle in the Valley where, “[m]any of them became involved in orchards [...]”<sup>8</sup> Two factors assured this image of safety, and therefore were pull factors for Loyalist immigration. First, the English possession of Nova Scotia – secured politically with the Treaty of Utrecht – was ensured militarily with the conquest over the French at Ile Royal and Ile Saint-Jean. Second, the familiar government structure of an assembly was established in Halifax on October 2, 1758. These efforts of recreating English structure in the colony was comforting to the recently defeated Loyalists, and originally a contributing incentive for the Planters’ immigration to Nova Scotia. The coming of these Anglophone settlers, along with others from such places as the Isle of Wight, consolidated the English hold on Nova Scotia.

Acadians, Planters, and Loyalists all contributed their own varieties of apples, and farming methods upon their immigration. From this the apple industry was established as a major component of Valley agriculture. Although the Loyalists also brought apple trees after the Acadian expulsion, “the growing of fruit trees remained a sideline rather than an industry in itself for another fifty or seventy-five years.”<sup>9</sup> The export connection with Britain was always present. *Journey Through Nova Scotia* observed that in 1774 farmers could export to any port in Europe through its rivers.<sup>10</sup> These two factors – a growing apple industry and export connection – set the stage for the rise of the British market.

### The Rise and Loss of the British Market

Known exports to Great Britain began in 1849, but the 1860 and 1862 International Exhibition in London yielded many awards for Nova Scotian apples, fuelling the demand for the commodity.<sup>11</sup> Nova Scotia growers became increasingly dependent on this foreign market, and by the 1930s Nova Scotia growers exported over 85% of their crop.<sup>12</sup> The demand from Britain led to numerous new orchard plantings between 1880 and 1920, often on marginal land.<sup>13</sup> Apple trees take six years or more to come into peak production, so these plantings poised the Annapolis Valley for record production coming into the 1930s.

The Great Depression left economies weakened, however the Apple industry mitigated its effect on the Annapolis Valley due to jobs on farms and in apple evaporators.<sup>14</sup> Despite the industry’s relative strength during this era, there were signs of weakness in the British market on which Nova Scotia growers were so heavily dependent. In 1932 Canada secured the a tariff, the “Imperial Preference” in Great Britain on all apples imported from the U.S., giving Canadian growers a competitive advantage over their American counterparts.<sup>15</sup> This helped to sell a record of 8 million bushels of apples in 1933 but marked increased international pressure on the market.<sup>16</sup> Furthermore, in 1935 fruit consumption in the U.K. dropped over 15% and by 1937 the U.S. was applying pressure on Britain to drop the Imperial Preference.<sup>17</sup> Throughout this time period members of the Nova Scotia Fruit Growers’ Association worried about this growing international and domestic supply available to the United Kingdom, and stressed quality and retention of the imperial preference as solutions to their marketing problems.<sup>18</sup> A slow British market in 1938 combined with a reduced tariff indicated further signs of erosion in the market, and by the time war was declared in the fall of 1939 Nova Scotia growers had a

sizable crop of apples with little to no export capacity.<sup>19</sup>

Various factors sealed the collapse of the British market once the war set in: little or no space on ships making the voyage, an extremely high cost of transportation, increased domestic supply in Great Britain and the reputation for unreliable quality that Nova Scotian apples had developed.<sup>20</sup> The neglected local markets, which already imported fresh apples when quality was a concern, weren't able to absorb the Valley's huge excess supply.<sup>21</sup> As a result various forms of processed apple products were developed, and research was even done into the use of apples as animal feed in an effort to dispose of an otherwise unmarketable crop.<sup>22</sup> In addition, growers lobbied the federal government for assistance and received a significant amount; however it was still insufficient for growers to cover the full cost of production.<sup>23</sup> Throughout this time growers expressed hope that the British market would return when the war ended, but not until 1949 did the NSFGA finally acknowledge its inability to regain the province's prewar export markets.<sup>24</sup>

Government support propped up the industry during the war years and until at least the early 1950s,<sup>25</sup> giving time for valley growers to adjust to the new demands of the market. This was accomplished mainly through the tree removal program, which removed less profitable trees and encouraged their replacement with newer varieties or other crops altogether.<sup>26</sup> Over 800,000 trees were removed between 1939 and 1952—at one point with an incentive of \$2 a tree—leading to a shift from harder varieties grown for export to newer more popular ones such as Cortland and McIntosh.<sup>27</sup> Many growers took advantage of this incentive and abandoned some or all of their orchards and took to livestock or vegetables; F. Waldo Walsh commented in 1941 that “the farmers in this area have made a real endeavour to supplement their earnings by diversifying farm production”.<sup>28</sup> Nova Scotian farms have generally been more diverse than their counterparts in the rest of Canada.<sup>29</sup> However as the apple industry required more and more efficiency to be profitable, larger more specialized growers tended to adopt new technology and retain their orchards while other farmers continued the tradition of mixed agriculture, at least initially.<sup>30</sup> This resulted in perhaps less diversification within farms, but more diversification when looking at the Annapolis Valley as a whole.

The NSFGA supported this diversification in a number of different ways. First, they provided resources for diversification during their annual conventions and subsequently in their annual reports. Sessions on growing onions, tomatoes and carrots are detailed in the early war era annual reports.<sup>31</sup> Secondly, when considering policy decisions for the good of the industry of a whole they lobbied Ottawa for another tree removal bonus to help farmers who needed to get out of apples have capital to get into other commodities.<sup>32</sup> The association also mentions in several of its reports the importance of growing food, especially vegetables, as an integral part of the war effort suggesting that demands of the war also played a role in shaping agriculture for some years.<sup>33</sup>

### **Changes in Agriculture (1945-2000)**

WWII had a far-reaching influence on agricultural patterns in the Annapolis Valley. In the same way that scientific breakthroughs had helped win the war against Germany and Japan, more scientific methods were also applied to farming, with the same goal of gaining a technological advantage in mind.<sup>34</sup> Nova Scotia's export market had become crucially

important, especially for apples. Indeed, there is report that George Chase of Port Williams, a major dealer in apples, organized trade of dehydrated apples with Goering and Hitler for fertilizers in the early 1930s.<sup>35</sup> Fertilizer became vital to a farm's success after WWII, because of the lower margin for inefficiency allowed by an increasingly competitive industry. Certainly, many factors acted upon Kings County's agriculture industry as Nova Scotia adjusted to peace and new farming technologies. The areas of Nova Scotian society that changed alongside technology, and influenced the agriculture industry are as follows: land consolidation, transportation, marketing, and government policies.

### Technological Change

The use of technology grew steadily since about 1921. There was a significant increase in technological innovation and application especially between 1941-51, when WWII forced drastic changes.<sup>36</sup> Too often the concept of technology is too-narrowly defined as machines or other physical implements, which dates back to the prominence of machinery in the Industrial Revolution, and is currently perpetuated through the central role of the computer in the Information Age. Technology is, however, knowledge **and** physical implements (“machinery”) because both fulfill the “application of scientific knowledge for practical purposes.”<sup>37</sup> Crop rotation is an example of knowledge-based technology, and it was largely replaced in the Valley by monoculture and the application of fertilizers, of which the latter tripled in use between 1941 and 1961.<sup>38</sup> Fertilizers allowed farmers to maintain nutrient levels of soil while growing the same crop. Furthermore, the development of soil analysis provided the information that was required to apply the proper nutrients.<sup>39</sup> Indeed, science has provided increased understanding of many small factors that affect farming. This knowledge, and the technologies it spawned have resulted in two major changes in the agriculture industry: less labour involved in farming, and increased annual yield.

The introduction of tractors, electric motors, tilling and harvesting equipment to the agricultural industry increased the horse power available to farmers, and thus reduced the number of labourers and horses previously required. For example, before the use of tractors and better spraying equipment, it took one hour for three men to spray one acre of land; whereas new technologies allowed one man to spray twelve acres of land in one hour.<sup>40</sup> As for the apple industry, mechanization of the harvesting process is limited because apples picked for fresh sale must be handpicked to retain acceptable quality. Although many efforts have been made at building a mechanical apple picker, the fruit is usually so bruised that it is acceptable only for making juice. In practice, such machines have not proven to be feasible despite the best efforts of local inventors like Keith Boates of Woodville.<sup>41</sup> Therefore, harvest mechanization within the apple industry is only acceptable for apple juice processing.

Better understanding of the small details of farming had significant consequences. Experimentation with apple rootstocks and varieties had initially allowed the industry to become large enough to supply the British market. Tougher varieties were produced during this time to withstand the voyage overseas in sailing ship or steamer.<sup>42</sup> After the war, and with more emphasis on local markets, desirable characteristics in apples have gravitated from durability to more aesthetically oriented criteria with the colour red being the predominant characteristic.<sup>43</sup> The long-established process of grafting apple varieties onto various rootstocks has more recently been used by farmers to control the size of trees to ensure maximum yield. Trees have gone from the original to production on smaller rootstocks, of

which *beautiful arcade* was the first to significantly change the size of trees.<sup>44</sup> Smaller trees, combined with more aggressive annual pruning, now produce a more consistent quality of apples because sun exposure is available to all of a tree's fruit. Apples on standard trees will have fewer ripened apples in the middle of trees, because sunlight did not reach them as much as those on the outside of the trees. The development of Y-shaped trellises in Belgium has taken hold in the Valley.<sup>45</sup> With the ever decreasing size of apple rootstocks, the construction of trellis systems is necessary, because they cannot physically support the weight of their yield now.<sup>46</sup> Trellises, like other new technologies in farming, are expensive to build, and therefore only yield maximum profit in large-scale specialized farming, which will be explained in "Land Consolidation."

As mentioned above, fertilizers allowed for the same field crops to be planted on the same land every year. Pesticides provided more certainty of yield. It should be noted that safety and the quantity of pesticides used has been improved since its first widespread use in the middle of the 20<sup>th</sup> century. When the apple market first strengthened in the late 19<sup>th</sup> century, farmers had largely continued using the chemicals earlier used on their potato crops: DDT, lead arsenate, Bordeaux Mixture. Newly developed chemicals are thought to be less harmful to humans and the larger environment.<sup>47</sup>

The technologies for harvesting crops, while improving efficiency, also enabled farms to become larger. Within the apple industry, this included a switch from horses to tractors, and from wooden barrels to bulk bins that could be moved with the tractor's front-end loader. Crucial in the improved efficiency was the development of cold storage.<sup>48</sup> Without a way to store the growing yield, crops would rot, and money would be lost. Farmers moved from storing barrels of apples in frost-proof cellars to storages artificially cooled, and even later, to controlled atmosphere storage that not only cools the fruit, but controls levels of oxygen and carbon dioxide, partly by injecting nitrogen into the air.<sup>49</sup> The technology that enabled the decreased amount of labour and increased yield was very expensive, and changed the financial operation of farms.

Technology that allowed for lower labour costs while increasing yield was very expensive, however, and changed the financial operation of farms. Economies of scale were thought to be the answer to higher costs.

### Land Consolidation

In the last half of the 20<sup>th</sup> century until the present, farms increasingly operated on credit to afford new technologies. There was pressure to become a large farm because they could produce cheaper and more consistent supplies to the increasingly amalgamating grocers. Essentially, the use of the developing technologies meant that you had to produce more to cover its cost, and the ability to produce more depended on the new technologies. A farmer could increase a farm's yield per acre, harvest that yield efficiently, and extend the life of those crops through better storage. The missing piece was more land to make technology profitable through economies of scale.

After WWII, the Federal War Veterans' Act assisted returning soldiers in the purchase of farmland, "to give the boys something to do."<sup>50</sup> The nature of farming at this time was a mix of small diverse farms, with the early beginnings of increased technological use. As technology

grew in importance there was an increased pressure on those who relied on farming for income to either upgrade or leave the industry, and that is what happened. From 1946-'66 the number of people moving to cities increased significantly.<sup>51</sup> By 1961, the Federal *Agricultural Rehabilitation and Development Land Act* assisted existing or new farmers in the purchase of farmland.<sup>52</sup> This resulted in the purchase of smaller farms by larger farms. (See the graph below for farm consolidation patterns.)

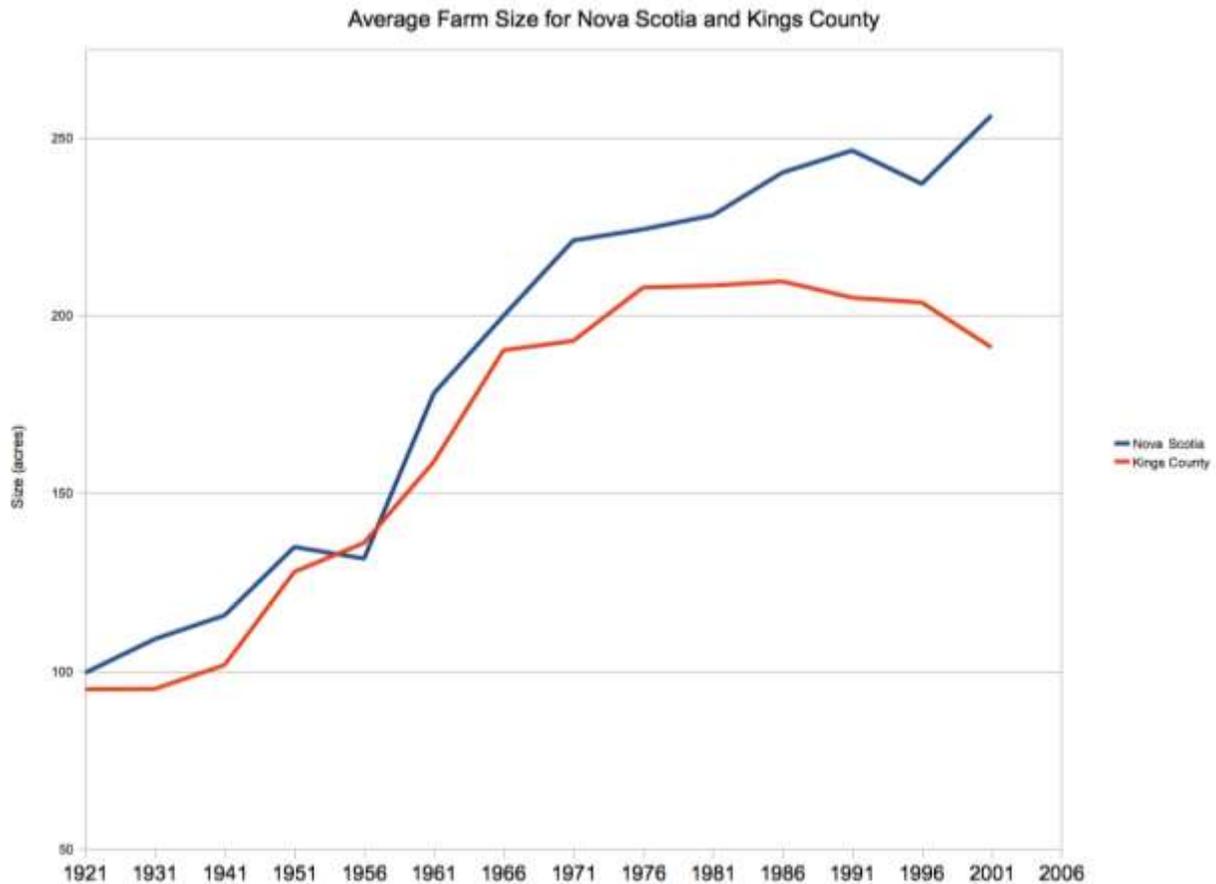


Figure 1: Farm Consolidation Patterns in Nova Scotia in comparison to Kings County. Derived from Statistics Canada data.

Another aspect of this process is the trend toward specialization on these consolidated farms. With efficient technology, and more land with which to produce a high yield to cover the increased operational costs, why did farms not maintain diverse agriculture? In the days of crop rotation as a farming practice there was a benefit to planting a variety of crops because nutrient depletion was mitigated.<sup>53</sup> Farmers kept cattle partly to have manure with which to fertilize their land. However, aforementioned introduction of monoculture with fertilizer application made farm specialization possible, and economies of scale made it profitable. By producing large volumes of one type of crop farmers spread the initial and operational costs of technologies over more units of production. Therefore, the cost per unit decreased, and made large-scale farms profitable while smaller farms struggled to remain competitive. Diversification of crops would in most cases require different technologies, and forfeit the advantages of buying in bulk, and focusing on one crop.

It should be noted that just as there were limits in the application of mechanized harvesting to the apple industry, the Valley was slow to benefit from large-scale farming through land consolidation. The geography of Nova Scotia is not characterized by vast stretches of flat land like the Canadian prairies or American mid-west for example. Furthermore, while farm size increased, the total productive farmland has decreased rapidly in Nova Scotia (See graph below). In order to protect farm land from encroachment by residential and commercial pressures, the municipality of Kings passed a *Municipal Planning Strategy* in 1979, which zoned certain lands strictly for agricultural use.<sup>54</sup> Although this has largely achieved its purpose of protecting farm land, one result has been to decrease its value. Farmers who have always relied on their land as a form of retirement pension are unable to sell it at potential development values. Low profitability from agriculture has led to increasing attacks on the planning strategy's rules, from farmers wishing to establish a golf course, tourist attraction, or feed processing plant on their land, or to use farm land for their own retirement houses.<sup>55</sup>

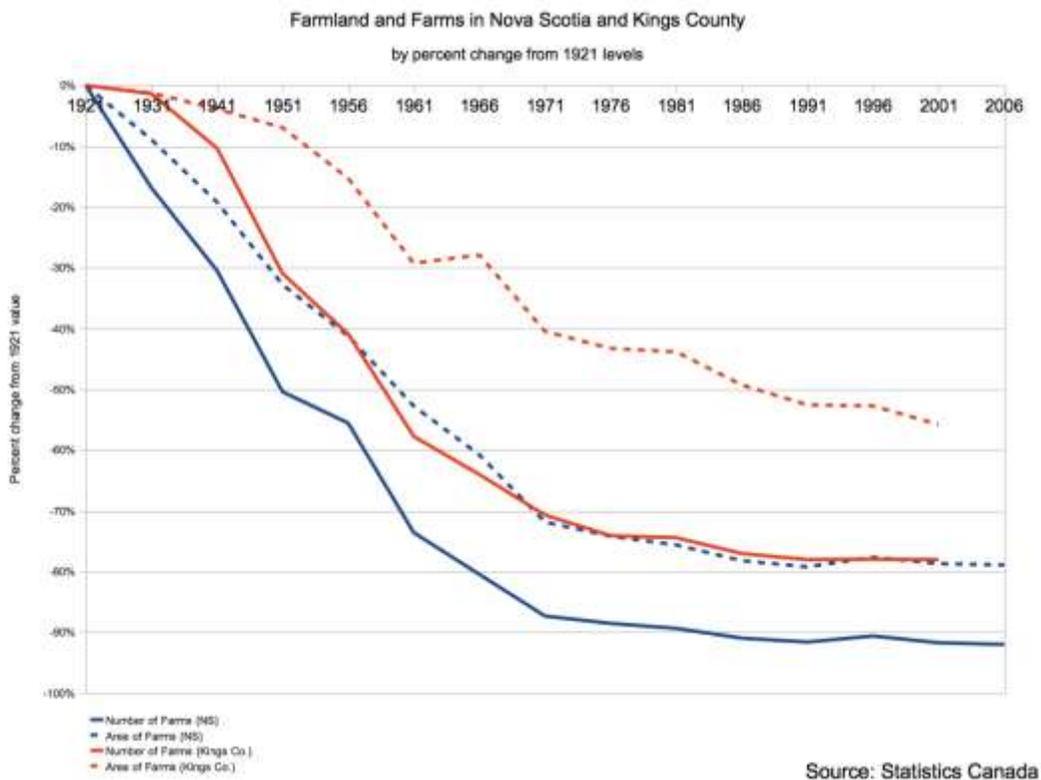


Figure 2: Farms and Farmland in Nova Scotia and Kings County: Changes Over Time. Source Data: Statistics Canada

### Transportation & Marketing

Transportation has always been important in Kings County agriculture, first as a way to export apples to the British market during the peak of the industry and a factor in increased national and international competition, then as the backbone of continental distribution chains that reduced demand for local produce. This shift in transportation has led from dominant trading with Britain and Europe to the integration of the Valley to North America.<sup>56</sup> As world

commodity markets became more accessible there was a need for local farmers to differentiate and find markets for their product.<sup>57</sup>

Nova Scotia started importing apples at least as early as the height of apple production during the 1930s because quality apples were generally exported.<sup>58</sup> This may represent the beginning of an increasing consumer demand for quality produce, and after the war this expanded to a demand for year round availability. As a generalization for all the maritime provinces, this immediate postwar period saw supermarkets turning to distribution chains as this new demand couldn't be met by a number of small farms working independently,<sup>59</sup> although it should be noted that some farmers were countered this by working together in cooperatives or companies such as Kings Produce to provide more volume and consistency to large buyers.<sup>60</sup> The Annapolis Valley may have felt this effect later due to its relative isolation, which only accelerated after the construction of Highway 101 in the early 1970s.<sup>61</sup> As the valley lost this isolation, the influx of food from outside added competition to an industry already under stress from costs rising faster than prices.

As transportation provided better and better access to a consistent year round supply of produce, marketing became steadily more important on small farms across the country,<sup>62</sup> and thus has become a large factor in the Annapolis Valley where small farms are common. As farming became steadily less profitable after World War II,<sup>63</sup> some farmers chose to take on the role of those farther up the distribution chain to maximize their returns, however this meant that agriculture became less about growing and more about marketing crops as farmers took on more responsibility in distribution and direct marketing.<sup>64</sup>

Over the years there have been changes in the viability of each of these options. While selling to the wholesale market has always been an option, wholesalers are now less commonly based in the Annapolis Valley or even in Nova Scotia.<sup>65</sup> In addition to moving the wholesaler's cut out of the local economy, this may have subjected farmers to a price affected by competition from other regions, which with the growth of distribution chains has allowed this practice to become more prevalent. This growth of widespread distribution has also affected the ability of farmers to market to retail chains as they became more reluctant to satisfy their demand directly from a number of different producers,<sup>66</sup> when a single year round source was available through their distribution chain. This is a direct impact of consumer demand for year round quality produce that followed the second world war.<sup>67</sup>

A positive trend in the market for produce lies at the level of direct marketing, evidenced by the growth in popularity of farmers' markets in Kings County and around the province.<sup>68</sup> Farmers' markets in Nova Scotia are a concept over 250 years old—the oldest consistently running market in North America is in Halifax<sup>69</sup>—however it was not until 1979 that the province first endorsed the concept in connection with the viability of agriculture.<sup>70</sup> Recently there has been an explosion of new markets as a result of this new demand, but the total volume of local produce currently sold is a fraction of both production and consumption<sup>71</sup>. Still there are farmers have been able to sustain themselves exclusively through direct marketing, and thus it is possible the farmers' market model may become sustainable for a large number of farmers.

A separate but related issue is the increased need to differentiate and add value to products from the farm, a trend which has only accelerated in recent years: the number of farms

labelled “Miscellaneous Specialty” increased four-fold between 1976 and 2001.<sup>72</sup> For example, a combination of environmentally conscious farmers and growing demand for produce grown without chemical inputs has led farmers to respond with organic growing methods. It is likely that none of these “miscellaneous specialties”, or organic production will singlehandedly solve the problem of low agricultural profitability, but the trend may mark a new type of diversification, this time aimed principally at local markets.

### Government Policy

Many governments around the world subsidize agriculture, but this is true to a smaller extent in Canada. However, while Canada may not subsidize agriculture to the extent of other governments, there has been significant influence from federal, provincial and municipal governments in the history of Kings County agriculture.

An example of a federal policy having wide reaching effect in Kings County was the Crow’s Nest Pass Agreement. First established in 1897, it was the first of several federal policies that subsidized the transportation of grain from the midwest<sup>73</sup>. Originally designed to carry “settler’s effects” westward to aid settlement while alleviating expensive transportation rates for midwestern farmers, the Crow rate essentially equalized grain prices across the country.<sup>74</sup> In the 1920s when “settler’s effects” were no longer necessary, the federal government modified the policy to simply subsidize grain and unprocessed grain products.<sup>75</sup> Through various political debates and circumstances, subsidized midwestern grain in several forms was a presence in Nova Scotia until 1993 when it finally met political demise at the federal level.<sup>76</sup>

One of these forms was the Freight Assistance Policy, passed in 1941 to help produce livestock to ship to the U.K. during the war.<sup>77</sup> The eastern provinces, containing land well suited for pasture were identified as amenable to livestock, which require little land when the need to grow feed is absent.<sup>78</sup> Central provinces were able to exploit a land and climate amenable to growing feed grain, so the Freight Assistance policy was enacted to jump start production in the east, which was also convenient to European markets.<sup>79</sup> Indeed, hog and beef production in Nova Scotia increased significantly during the war, likely as a result of the Freight Assistance Policy or simply the demand for bacon in England that inspired the policy in the first place.<sup>80</sup> Freight Assistance was originally enacted only for the short term,<sup>81</sup> but the subsidization of grain lasted much longer and helped build an organized livestock industry in the Maritimes, especially for hogs.<sup>82</sup> When Freight Assistance finally ended, the hog industry was left in an unstable climate that contributed to the industry’s collapse in the late 90s: between 2000 and 2008 the number of hogs decreased by 87%.<sup>83</sup>

The federal government paved the way for marketing boards through several tries at legislation starting in the 1920s through the early 1970s.<sup>84</sup> Marketing boards serve as a single seller for a particular commodity at the provincial or federal level, and while the establishment of a marketing board in a commodity offers a degree of price stabilization, it also adds another layer of bureaucracy to the system and limits the freedom of growers in that commodity.<sup>85</sup> A marketing board for apples existed during the war and was again debated in the early 70s without success.<sup>86</sup> However, the pros and cons of marketing boards have been debated for many different commodities in Nova Scotia and in Canada, and some have been implemented. Today over 80 marketing boards exist at federal and provincial levels.<sup>87</sup>

Supply management takes regulation of the commodity a step further and allocates quotas to growers based on consumption by province to prevent a market flood while ensuring the commodity price covers the cost of production. In Canada supply management was implemented for dairy in 1966, followed by broiler chickens, eggs and turkeys in the late 1960s.<sup>88</sup> This has had the effect of keeping agriculture dispersed across the country regardless of regional variation in cost of production, and while quotas based on local consumption imply that food produced stays in province, as wholesalers became more centralized this was no longer necessarily the case.<sup>89</sup> As the price of quota rose, larger producers bought out smaller producers and the high quota price deterred entry into the industry.<sup>90</sup>

Another federal presence in Kings County agriculture is the Kentville Research Station. Established in 1911 as a research station for primarily apples,<sup>91</sup> the station has served as an invaluable resource to area farmers of all types. The history of the Kentville Research Station and its specific effects on agriculture is extensive, however the common theme throughout is that research from the Kentville station found ways to increase efficiency of production by developing fruit varieties for the Valley's climate,<sup>92</sup> keeping the Annapolis Valley a competitive production area.

While research was a federal responsibility, the provincial government was responsible for establishing this information as a resource to farmers.<sup>93</sup> A network of extension agents were able to act as consultants to farmers, which amounted to an effect of cross pollination of information between farmers and researchers in agriculture.<sup>94</sup> In addition, the extension department provided services such as soil testing for free.<sup>95</sup> Government funding in agriculture declined as governments implemented budget constraints, and in 2001 the entire extension department was eliminated.<sup>96</sup> It was eventually transformed into AgriPoint, a government owned and partially government funded company, and while the company still conducts workshops and short courses, consulting is now a paid service.<sup>97</sup>

A common theme in federal and provincial policy is the gradual reduction in funding and, more recently, increasing international pressure over the subsidization of agriculture. Funding for research and extension services has been scaled back or eliminated, and subsidies like Freight Assistance were dropped or came under fire from the international community, especially under the North American Free Trade Agreement (NAFTA), for producing an unfair advantage in export markets.<sup>98</sup> There is a similar criticism of policies allowing for supply management, however this stems from the tariffs reducing the ability of other countries to export commodities into Canada that are under supply management here.<sup>99</sup>

### **Conclusions: The Current Trends in Agriculture**

The fulcrum of our topic was the loss of the British export market for Kings County's apple industry. Further research led us to the changes that ensued, and now we find that Kings County sits at a crossroad regarding the use of its farmland. Two theoretical endpoints present themselves: on one hand, there is a self sufficient Valley reminiscent of the isolation of a century ago, and on the other hand there is continued specialization according to the free market.

Moving in the direction of self sufficiency entails local consumption of local produce and building on locally sourced farm inputs, which has started to occur through farmers' markets.

In terms of scale, it should be noted that farmers’ markets account for a small percentage of trade in the agriculture industry, but we argue that it does not lose significance in indicating the transforming attitude towards food. One trend that has not yet been mentioned is the tendency for technology to source farm costs to out of province locations, which creates a shrinking portion of agricultural profit remaining in the Valley. Additionally, local consumption is a large piece of the agricultural puzzle. Eating local is far from a new idea—apple growers, after the industry’s crash, attempted to turn to local markets, and the growth of the hog industry can be attributed to policy pushing local consumption<sup>100</sup>—however this new trend is instead based on consumer demand. If this demand continues to grow it may be possible to push the Valley agriculture in this direction.

On the other hand, continued specialization of the Valley’s agricultural industry capitalizes on economies of scale made possible through international trade and reasonably open markets. We allude to “reasonably” open markets, because there is the complication of subsidies and cheap labour that are always a source of contention. In an open market, ideally, farmers are left with their comparative advantage as a determinant of whether they produce a certain cash crop or not, whereas the presence of subsidies and cheap labour artificially create comparative advantage. There is promise in new apple varieties, such as the HoneyCrisp and SweeTango, for being unique and therefore profitable to the Valley. Furthermore, if Nova Scotia were to completely specialize, production would likely gravitate to apples and blueberries as the Valleys strength.<sup>101</sup> As long as there is a demand for Valley agriculture in an international market, specialization offers potentially rewarding profits.

The direction Kings County agriculture will take is unclear, but the underlying cause of this change will not be government policy but consumer demand. The government has significant power to influence market competition by funding agricultural research and subsidizing commodities. Regarding the two influential players in agriculture, the economy and government both respond to the demand of consumers. Therefore, it is not completely in the hands of an institution to decide what constitutes the value of food – simply price? Or other factors? Whichever course of action is taken, the communities within Kings County must agree on a path; the efficiency, and therefore competitiveness that characterizes the world today leaves no room for division and vacillation.

### Closing Comment

Echoing the words of Hugh Allison Blackmer at the beginning of this chapter, we also feel strongly that there is much more we wanted to research. As outsiders to agriculture in Annapolis Valley we would like to thank Anne Hutten for her patient and thorough editing. Having farmed all her life, and written specifically about the Valley’s apple industry in Valley Gold, we are very appreciative to have an authority on this subject focus our words when they would otherwise have gone astray in the last two weeks of this project.

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<sup>3</sup> Anne Hutten. *Valley Gold: The Story of the Apple Industry in Nova Scotia* (Halifax, Nova Scotia: Petheric Press Ltd., 1981), 3.

<sup>4</sup> Margaret Conrad, ed. *Making Adjustments: Change and Continuity in Planter Nova Scotia 1759-1800*

- (Fredericton, New Brunswick: Acadiensis Press, 1991), 47.
- <sup>5</sup> Hutten, *Valley Gold*, 3.
- <sup>6</sup> Margaret Conrad, ed. *They Planted Well: New England Planters in Maritime Canada* (Fredericton, New Brunswick: Acadiensis Press, 1988.), 15.
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- <sup>8</sup> Hutten, *Valley Gold*, 14.
- <sup>9</sup> Hutten, *Valley Gold*, 14.
- <sup>10</sup> John Robinson, and Thomas Rispin. *Journey through Nova-Scotia containing a Particular Account of the Country and its Inhabitants* (Sackville: Ralph Pickard Bell Library, Mount Allison University, 1981 ed.), 6.
- <sup>11</sup> Wolfville report, page 8
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- <sup>14</sup> Anne Hutten Presentation; valley gold 44
- <sup>15</sup> Hutten, *Valley Gold*, 44
- <sup>16</sup> Richard Hennigar, 2009. Interview by Dewey Dunnington. November 2.; Hutten, *Valley Gold*, 45.
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- <sup>22</sup> Anne Hutten. 2009. Interview by authors. November, 10.
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- <sup>46</sup> Anne Hutten, 2009. Interview by authors, November 10.
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# Chapter 11: Pesticides – History, Present, and Possible Futures

– *Douglas Armour and Edward Fredenburg*

## Introduction

Pesticides and their usage, both locally and throughout the world, have become an increasingly important issue over the years. The rise of environmental awareness has propelled pesticides and their impact into the public sphere, and has precipitated increased restrictions upon their employment and sale. Beginning humbly, pesticides underwent a period of rapid expansion thanks to the chemical breakthroughs of the Second World War, and continued to increase, both in use and complexity, in the postwar years. These scientific advancements were not always for the better, both in terms of the environment and human health. Examples of the hazards of pesticides abound, perhaps none greater than that of DDT, and such examples have spurred ever-increasing calls for the limitation or outright banning of pesticides. Many point to the beneficial gains from pesticides however, arguing that the benefits they provide outweigh their negative impact, especially in the modern era of close regulation and monitoring. This dichotomy, of the good and evil of pesticides has driven intense debate, involving farmers, politicians, environmental activists, and the general public. This examination will explore the history of pesticides in Nova Scotia, focusing specifically on Kings County and the surrounding Annapolis Valley. In addition, it will examine the modern regulations which attempt to ensure that pesticides are employed in an environmentally conscientious manner. Finally, an examination of three possible futures of agriculture in Kings County will be undertaken, and the role of pesticides in each of these possible futures will be explored.

Given the complexity of the issue of pesticides, some general information is perhaps the easiest way to begin. The Food and Agriculture Organization of the United Nations defines pesticides as:

any substance or mixture of substances intended for preventing, destroying or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs, or substances which may be administered to animals for the control of insects, arachnids or other pests in or on their bodies. The term includes substances intended for use as a plant growth regulator, defoliant, desiccant or agent for thinning fruit or preventing the premature fall of fruit, and substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport.<sup>1</sup>

This all-encompassing definition is nonetheless perhaps too exact for many. Pesticides, for most, encompass three main categories, herbicides designed to kill weeds, insecticides for the elimination of insect pests, and fungicides to eradicate pest fungi. In addition to these main categories, numerous others, for the control of fish, birds, snails, bacteria, and viruses among others, exist. While each of these may be designed to eliminate an individual animal or species, they all fall under the blanket of pesticides. In contrast, the government of Nova Scotia

defines pesticides simply as “chemicals, organisms and devices designed to control, destroy, attract or repel pests.”<sup>2</sup> Given the regional focus of this paper, the definition given by the Nova Scotia government will be primarily employed. For the purposes of simplification, the terms pesticide or pest control product will be used to cover all instances within this report, instead of differentiation into unique subcategories. Given the focus of this paper on Kentville and the surrounding Kings County, the examination will primarily focus on pesticides related to agricultural usage, and those related to private usage on personal properties such as lawns and gardens. It must be remembered however, that such pesticides are not the entirety of the spectrum, but simply those employed in the greatest concentrations within the region.

### Evolution of Pesticides Within the Annapolis Valley

The history of pesticides in Kentville and the surrounding Annapolis Valley is a long and varied one. Over the years, pesticides have evolved from the “be all and end all” of attempts to control the pest problem in farming and the apple industry, to a source of environmental concern and a less viable option for many farmers. The use of pesticides in the Annapolis Valley dates back to the end of the nineteenth century, and has been a continuous practice ever since. While pesticide usage today may be at its lowest levels since its inception, it is by no means at the point of extinction. Over the years, pesticides have varied from materials harmful not only to the pests that they were intended to rid, but also to crops, animals, and humans alike, to modern materials intended solely to eliminate the pest species and prevent damage to any other life forms. A significant variety of chemicals and chemical compounds has been employed as pesticides in the farms and orchards of the Annapolis Valley and Kings County, from materials such as lead and arsenic, which have become known poisons in modern times, to the intricate and complex organic chemical mixtures employed on modern farms. That is not to say of course, that pesticides were employed throughout their history in Kings County without regard for their adverse effects. Throughout the history of pesticide usage in the county and surrounding valley, farmers, scientists, and others have sought improved pesticides, not simply for their pest killing capacities, but also to limit the damage caused to the environment, both plant and animal, non-pest insects included.

As indicated above, the first recorded usage of pesticides in the Annapolis Valley dates back to the end of the nineteenth century. Paris Green Insecticide was the first pesticide used in the apple orchards of Nova Scotia and, although it proved successful in the elimination of pest species, had the negative side effect of damaging the very plants that it was employed to protect.<sup>3</sup> Following the usage of this first pesticide, many others began to be used. A 1958 report to the Nova Scotia Fruit Growers’ Association, from R.G. McKelvie, the Superintendent of Inspection Services for the Food and Drug Directorate, on the problem of pesticide residues on crops, states that before the chemical advances of the Second World War, inorganic materials, “many of them of relatively low human toxicity” made up the majority of the pesticide materials employed.<sup>4</sup> As McKelvie stated in his report, “arsenicals, sulphur, lime-sulphur, and copper compounds were the most common types.”<sup>5</sup> Organic pesticides were also employed, as McKelvie writes that “[h]ighly toxic organic materials such as nicotine, carbon disulphide and hydrogen cyanide were also used but their range was limited.”<sup>6</sup> The period between the two World Wars saw the rise of inorganic fluorine compounds and organic compounds such as the pyrethrins and rotenone, as well as synthesized organic pesticides including dinitro- and thio-cyanate compounds.<sup>7</sup>

It was however, out of the horrors of the Second World War that pesticides would see their greatest leap forward. Following the war, “the Chlorinated Hydrocarbons made their appearance, with DDT contributed by Switzerland, BHC by the United Kingdom and France...followed in the U.S.A. by Toxaphene, Chlordane, Aldrin and Dieldrin.”<sup>8</sup> Such chemicals were joined by their wartime brothers, the organic phosphates such as “HELP, TEPP, Parathion, Malathion and Diazinon.”<sup>9</sup> The advent of these new chemicals saw the pesticide market skyrocket. McKelvie helps to put this explosion into perspective with his remark that “In 1957 it is estimated that 25 million dollars was spent in Canada on pest control products. Ten years ago [i.e., in 1947] the sales amounted to 7.2 million dollars.”<sup>10</sup> These chemicals brought about increased precision in the control of pests. However, they proved, in comparison to the inorganic compounds employed by the majority of Nova Scotia farmers and apple growers, to be more harmful to humans, and more likely to leave behind a lasting residue upon surfaces, and crops, to which they were applied. McKelvie perhaps summarizes this seismic shift in pesticides, from the inorganic to the organic, best with the simple statement that this move was a “considerable changeover from the less toxic to the more powerful insecticides”.<sup>11</sup> This increased hazard also spurred the rise of increased controls and regulations of pesticides, both within Nova Scotia and throughout the world.

The threat, both to humans and the environment, posed by such pesticides was, of course, a concern and a cause of greater action, but this was not the start of concerns over pesticides in Nova Scotia. As early as the closing years of the Second World War, tests in Nova Scotia were underway in order to increase pesticide activity. Such tests, while ultimately designed to find the most effective pesticides, sought those which worked within the natural structure of the region, that is to say, which eliminated the pest species while preserving beneficial life forms. The desire to eliminate pest species was not solved through the elimination of all species. This was understood by many in the Nova Scotian farming and apple communities, and they sought ways to employ pesticides, in a manner of speaking, as a complement to natural predators.

A 1948 report by A.D. Pickett to the annual meeting of the Nova Scotia Fruit Growers' Association provided an example of such experiments. Specifically concerned with the Oystershell scale, a pest of growing concern economically, in the apple orchards of Nova Scotia, the test measured the surviving numbers of pests over three years, 1944 through 1946, of treatments programs with different pesticides. These tests determined that the common pesticide employed in Nova Scotia at the time, sulphur-based sprays and dust, notably lime-sulphur, were ineffective in the elimination of Oystershell scale. This was not due to the ineffectiveness of the spray, but in fact to its over effectiveness. As Pickett stated in the summary of findings, “...our experiments show us quite definitely that it increases on a program of mild sulphur sprays since these destroy both the parasite and the predaceous mite which keep it under control under natural conditions.”<sup>12</sup> In other words, Lime-sulphur sprays killed a beneficial mite which preyed on the Oystershell scale, restricting the latter's impact, but it remained effective against the scale also only because it killed off the scale in sufficiently large numbers to prevent it from becoming a problem.<sup>13</sup> The results demonstrated however, such a program would never fully eliminate the Oystershell scale, but instead restrict its damage to a manageable level.

As an alternative the authors of the study suggested the use of copper sprays or Fermate. As Pickett noted, these chemicals, either in use by themselves or in combination with

each other, would “allow both the parasite [to the Oystershell scale] and the predaceous mite to thrive and these will eventually destroy the scales.”<sup>14</sup> Also noted is the fact that though orchards subjected to “very” consistent usage of sulphur sprays were unlikely to see a reduction in the first year, with the build-up of beneficial species now spared by the switch in sprays, “there does not appear to be any doubt but that the reduction will be marked in the second year and almost complete in the third.”<sup>15</sup> These conclusions, and the recommendations which arose from them, demonstrate an early understanding of the necessity for pesticides not to be a solution that engendered mass destruction, but to work within the bounds of, and complementary to, natural predation. Without natural predators, results demonstrated that the total destruction of pest species by the application of pesticides alone was, in many cases, a fantasy. With the ensured survival of predator species however, a complete reduction may in fact have been possible.

This recognition of the benefits of ensuring the survival of predator species continued throughout the following decades. A “History of Fruit Growing In Nova Scotia - 1860-1965” by R. P. Longley presented to the Nova Scotia Fruit Growers’ Association in 1965 reaffirmed this need for the survival of beneficial predatory species. Longley went beyond simply echoing the belief however, and called the results of modified spray programs designed with the survival of beneficial species in mind to have been “spectacular under the climatic and flora conditions of Nova Scotia.”<sup>16</sup> Longley noted the example of the red mite and codling moth, which had, prior to modified spraying, been responsible for heavy damage.<sup>17</sup> However, with the implementation of modified spray programs, Longley wrote that “[m]any orchards have now not had a miticide spray for many years and some practically no poison most years.”<sup>18</sup> Even those chemicals which still needed to be applied, such as lead arsenate, were chosen to have “little serious effect on parasites and predators.”<sup>19</sup> While this may have been true, lead arsenate did present a risk due to the lingering remains of arsenic residue on produce despite washing, as well as the build-up of both lead and arsenic in the soil.<sup>20</sup> Longley's report presented another benefit of ensuring the survival of beneficial species, that being the reduced costs associated with reduced pesticide requirements.

Interestingly, the first useful substitute to lead arsenate was also one of the primary causes of the increase in public environmental interest.<sup>21</sup> Introduced in 1947, DDT was believed to be the perfect pesticide. However, with the publication of Rachel Carson's seminal work *Silent Spring* in 1962, which detailed its overwhelmingly negative environmental effects, the world was presented with one of the first widespread environmental issues. Throughout the developed world the concern was palpable, and the use of DDT, and indeed all pesticides fell under increased scrutiny. The agricultural and apple industries of Nova Scotia were no exception, though their continued usage of DDT, until a ban on its use came into force in 1969, in the face of presented evidence should be noted.<sup>22</sup> This desire for pesticides to be compatible with the environmental movement became a powerful motivator within the Nova Scotia agricultural and apple industries, and indeed throughout much of the world. As Nova Scotia Fruit Growers’ Association president F. Keith Boats stated in his 1972 presidential address at the group's annual meetings, “the ultimate goal is to produce fruit with a minimum of pesticides and in harmony with the environment.”<sup>23</sup>

It must be remembered however, that the rise in public environmental awareness in the years following the publication of *Silent Spring* was not the impetus for environmental action with regards to pesticides in Nova Scotia. Indeed, the issue of pesticides and the environment

had long been a complex issue in Nova Scotia. Despite the seemingly dubious continued use of products such as lead arsenate and DDT despite the evidence of environmental damage, Nova Scotia remained committed to the attempt to combine environment protection and pest reduction. Various methods were introduced, from the use of pesticides believed to be more environmentally friendly to the removal of trees, both wild and those whose owners did not present “sufficient interest to control the pests”.<sup>24</sup> The issue of pesticides and the environment in Nova Scotia, at least from an agricultural point of view, was one of constant attempts to improve pest removal, while at the same time to lessen the environmental impact. As Boats stated in his address with regards to the issue, “[p]lease remember that our growers and research personnel have been aware of and working on this sort of problem longer than anyone else in North America.”<sup>25</sup>

### Regulation of Pesticides in Canada: An Overview

The environmental movement of the 1960s and 1970s, while it may not have begun the push for more environmentally-friendly pesticides in Kings County and the rest of the Annapolis Valley, did bring about a new era of pesticide regulation in Canada. Prior to this period, pesticides were, for the most part, freely available in any farm equipment store, and little to no control was exercised over their usage. With the revelations about the effects of DDT and other pesticides on the environment however, pesticide employment was soon a highly regulated and controlled procedure throughout much of the world, and Canada was no exception. The regulations regarding pesticides have continued to evolve throughout the years, in an effort to keep up with the ever-increasing strength and complexity of available pesticides, and to ensure that new environmental problems and concerns are addressed. Today, all three levels of government in Canada, federal, provincial, and municipal, play a role in the regulation of pesticides. Pesticide regulation begins at the federal level, with the regulation of exactly what pesticides may be sold within Canada, and then flows down through the lower two levels of government. In addition to the regulation of pesticides, the federal government also compensates farmers whose crops are damaged by pesticides when used as directed.<sup>26</sup> Provincial governments are responsible for the regulation of pesticides within their province, everything from their sale to their disposal. Municipal governments may, within the regulations established by the provincial government, place further restrictions on pesticides within their boundaries.

Pesticide regulation in Canada today begins with the federal government. The federal government, as previously stated, holds authority over whether or not a pesticide product may be sold within Canada. In addition, the federal government is responsible for setting the Maximum Residue Limit, or MRL, which must be met for all pesticides used within the country.<sup>27</sup> The federal agency responsible for the regulation of pesticides at a federal level is the Pest Management Regulatory Agency, or the PMRA, a branch of Health Canada. The PMRA was established in 1995, and operates with the stated mission of “protecting the health and environment of Canadians and supporting Canadian competitiveness by regulating pest control products (pesticides) and their use in an effective and transparent manner.”<sup>28</sup> While acts such as the Hazardous Products Act, the Consumer Product Safety Act, and the Canadian Environmental Protection Act are employed in the regulation of pesticides, such regulation is addressed and controlled primarily by the Pest Control Products Act, or PCPA.<sup>29</sup>

The PCPA provides the guidelines on the regulation of pesticides at a federal level in

Canada, from the process of pesticide regulation, to the product's regulation after a pesticide is successfully registered, and the penalties and consequences of misuse of pesticides within Canada. The stated primary objective of the PCPA is "...to prevent unacceptable risks to people and the environment from the use of pest control products."<sup>30</sup> In addition to, and in support of, this primary objective, the PCPA also seeks to:

- (a) support sustainable development designed to enable the needs of the present to be met without compromising the ability of future generations to meet their own needs;
- (b) seek to minimize health and environmental risks posed by pest control products and encourage the development and implementation of innovative, sustainable pest management strategies by facilitating access to pest control products that pose lower risks and by other appropriate measures;
- (c) encourage public awareness in relation to pest control products by informing the public, facilitating public access to relevant information and public participation in the decision-making process; and
- (d) ensure that only those pest control products that are determined to be of acceptable value are approved for use in Canada.<sup>31</sup>

These stated secondary objectives further reinforce the primary objective, and demonstrate that environmental, and human, protection is the primary cause, and goal, of pesticide regulation in Canada.

The major pesticide regulation at the federal level in Canada is the registration of pesticides, and this process is spelled out step-by-step in the PCPA. As stated, every pesticide sold in Canada must undergo this registration process before it can be made available for sale. The registration process is initiated by a formal application to the Minister in charge of the PMRA by a pesticide manufacturer, and then proceeds through numerous steps, panels, and individuals before final approval is granted or denied. This registration process, as laid out in the PCPA, may involve the use of information on other products which contain an equivalent active ingredient, as well as information from gathered by other governments, provided that "the proposed use of the pest control product in Canada would be under conditions similar to those under which the foreign review or evaluation was conducted."<sup>32</sup> In the end, as the PCPA states, "the applicant has the burden of persuading the Minister that the health and environmental risks and the value of the pest control product are acceptable."<sup>33</sup> While the Minister holds the final decision on whether or not to grant approval to the registration of a particular pesticide, he must consult with any other party, including the public and government agencies, both federal and provincial, who may be affected by the registration process.<sup>34</sup> There are certain pesticide products which are exempt from this registration process, however no pesticide involved in the agriculture industry possesses an exempt status from registration. Such exempt products include those items such as flea and tick medications and food preservatives regulated by the Food and Drug act, as well as some pesticides used in the control of viruses and bacteria.<sup>35</sup>

Once a pesticide is given registration approval, it is given a Pest Control Product Number, which is used to easily identify it in the future. In addition, all registered pesticides in Canada are placed into one of three categories, domestic, commercial, or restricted. Domestic class pesticides are those that are for use by individuals in and around the home. Commercial

and restricted class pesticides are those primarily employed by industry, such as agriculture or forestry, however restricted class pesticides have restrictions placed upon their use due to known hazards, both environmental and health related.<sup>36</sup> All registered pesticides are subject to the possibility of re-evaluation or special review if new information is discovered regarding the risk that they pose to people or the environment. In addition to review on the basis of new available information, all pesticides in Canada undergo review and re-evaluation of their registration following “several years” of their being on the market, and every fifteen years that they remain on the market.<sup>37</sup> In this way, all pesticides for sale in Canada are assured to adhere to the latest environmental and health standards enacted since their original registration. The federal government also mandates that the sales records with regards to all registered pesticides be reported to the PMRA at the end of each year, and that any and all spills or incidents involving pesticides be reported immediately to the agency.<sup>38</sup>

The PMRA also regulates the labelling of pest control products for sale in Canada. The labelling restrictions placed upon pest control products, as with those of any other potentially harmful material, are strict and designed to ensure that all relevant information is easily accessible. The labelling of a pest control product is required to display, in both English and French, among other information, the active ingredient and its concentration, the registration number of the product, and the company's name and address.<sup>39</sup> All pesticide labels in Canada are also required to state “read the label before using”, and domestic class pesticides must also state “keep out of reach of children”.<sup>40</sup> As well as its labelling, the federal government also regulates the packaging of all pesticides, in order to ensure that the product may be safely accessed and that the package will hold up to wear and tear on both it and its contents.<sup>41</sup>

The provincial government, while abiding by the regulations set in place at the federal level, is responsible for the regulation of the “sale, use, storage, and disposal of pesticides.”<sup>42</sup> This means that each provincial government is free to set their own regulations with regards to pesticides within their provincial boundaries. Nova Scotia regulates all pesticides, but the most stringent regulation is reserved for those designated as “commercial” or “restricted.” Nova Scotia law strongly regulates the employment of these pesticides, and requires certification for their usage, storage, sale, and purchase.<sup>43</sup> There are separate certifications for the sale of such pesticides, their use around buildings, in greenhouses, in industrial settings, for landscaping, control of mosquitoes, aquatic use, fumigation, aerial spraying, agricultural usage, and commercial pesticide businesses.<sup>44</sup> In order to gain one of these certifications, an individual must successfully pass a qualification test, and, unless special permission is gained, be at least eighteen years of age.<sup>45</sup> Each of these certifications is valid for five years, except for the business certification, which requires annual renewal, and certified individuals may be retested one time during the period.<sup>46</sup> Individuals over eighteen may apply pesticides in a structural, forestry, greenhouse, industrial, landscaping, or agricultural capacity provided that they are directly supervised by an individual holding a certificate in the applicable category, and such a situation may only last thirty days.<sup>47</sup>

In addition to the regulations on the usage of commercial and restricted class pesticides, Nova Scotia also places restrictions on the use of pesticides “on forested land, on utility corridors, rights-of-way, roads, streets, or highways, and industrial sites for soil sterilization”<sup>48</sup> Individuals applying pesticides in such areas must have approval at least sixty days prior to spraying, the application of the pesticide must be undertaken in such a manner and with such equipment as to minimize the impact of the use of the pesticide, the applicators must adhere to

any weather restrictions, and they must insure that the treatment site and any buffer zones are identified.<sup>49</sup> In addition to these restrictions, pesticide applicators are also required to notify the public of the application at least twenty days beforehand, stating when and where pesticides will be used.<sup>50</sup> Pesticide research is also highly regulated in Nova Scotia, requiring pre-approval, public notice, and signage that remains up at least thirty days after the close of such research.<sup>51</sup> Further restrictions are placed on the usage of pesticides in areas of environmental sensitivity or protected water areas, with the creation of buffer zones and special regulations in the hands of the Minister.<sup>52</sup>

Pesticide storage in Nova Scotia is also highly regulated. Individuals who store pesticide for their own use, whether personal or business, are required to do so in facilities constructed to prevent accidental release of the product.<sup>53</sup> The building used to store pesticides must be labelled with the statement “Warning – Chemical Storage – Authorized Personnel Only” or similar, and the facility must display a list of emergency phone numbers.<sup>54</sup> Individuals storing such pesticides must also provide an inventory of the stored pesticides to the local fire department chief upon request.<sup>55</sup> The storage of pesticides by vendors is even more tightly controlled than that of individual users, given the larger quantities involved. The construction or modification of such storage requires government approval, and must be done to meet all building restrictions, and prevent the accidental release of any pesticides.<sup>56</sup> The location of such storage facilities is restricted, requiring at least thirty metres of clearance from the banks or high water line of any surface water, or sixty metres from a well or surface water used as a private water supply, although these limits may be waived by approval of a government administrator.<sup>57</sup> Even the materials used in the construction of such a storage facility are regulated by the provincial government. Flooring is required to be steel or another material that will prevent absorption, the floor must be smooth and able to be cleaned and decontaminated, there must be a barrier of at least ten centimetres to retain any spills, no openings are allowed in the floor, at least two entrances and exits are required, as is ventilation, washing and decontamination facilities and running water.<sup>58</sup>

In addition to these restrictions on the facility used by vendors to store pesticides, restrictions are placed on the storage of pesticides within these facilities. Pesticides are required to be stored in a separate, locked, floor to ceiling room, at least ten centimetres off the floor and on non-combustible and easily cleaned shelving, away from any flammable materials and food items, with proper labelling, and placed so that they may be easily inspected.<sup>59</sup> In addition to these restrictions, all unique categories of pesticides, such as herbicides and insecticides, must be kept separated within the storage facility.<sup>60</sup> The operators of such facilities are required to provide all adequate safety measures, such as protective equipment, eye wash and shower facilities, warning signs, and emergency numbers, and to insure that any unauthorized access to the facility is prevented.<sup>61</sup> Such facilities must be inspected monthly to insure their compliance with all regulations, and cannot be abandoned unless they are left in a condition regulated by government administrators.<sup>62</sup>

The disposal of pesticides is also highly regulated in Nova Scotia. Nova Scotia law prohibits any individual from cleaning or filling any equipment used with pesticides in any way that may cause contamination.<sup>63</sup> The containers which held commercial or restricted class pesticides must be disposed of either at a designated collection site or in another approved manner.<sup>64</sup> As these regulations demonstrate, the use, sale, storage, and disposal of pesticides are all highly controlled within Nova Scotia. These regulations attempt to ensure the

continued safety and health of both the public and the environment, as well as those directly involved with the pesticides and their usage. Of course, as previously stated, these provincial regulations are in addition to the federal restrictions already placed upon pesticides and their usage in Canada.

While the federal and provincial government have clearly defined roles in the regulation of pesticides in Canada, the role of the municipal government is not as clearly defined. Municipal governments, as previously mentioned, may enact restrictions on top of those already placed by the higher two levels of government. In the case of Kentville, the only direct restriction that has been placed on pesticides is the prohibition of their storage in any of the four zones surrounding the town's well sites.<sup>65</sup> That is not to say however, that Kentville has done nothing else in regards to pesticides. The town has placed its support behind a proposal, first initiated by Wolfville, to ban the use of cosmetic pesticides, those used simply to beautify lawns and gardens.<sup>66</sup> While this proposal has gained the support of all Nova Scotia municipalities, it has, as of yet, received no action from the provincial government.<sup>67</sup> A similar ban has already been enacted in New Brunswick, and policymakers in Prince Edward Island expect that the province will pass its own ban early in 2010.<sup>68</sup> In addition to these provincial acts, the environment ministers of the Atlantic provinces hope to introduce a similar ban regionally.<sup>69</sup>

This is but an overview of the regulation of pesticides in Canada. At the federal level, pesticides are regulated by numerous government acts, though as noted the PCPA is the main regulatory act. The PMRA also receives input and cooperation from numerous other government agencies, including Environment Canada, the Canadian Food Inspection Agency, and Fisheries and Oceans Canada. At the provincial level, pesticides in Nova Scotia are regulated primarily through the province's Pesticide Regulations act. Given the relative lack of present regulation at the municipal regulation in Kentville, the restrictions on pesticides are limited to the Municipal Planning Strategy. The frequent updating of these acts, and the continued examination of pesticides in use in Canada, ensures that such pesticides are forced to conform to the latest environmental and human health standards.

### Personal Usage of Pesticides

As already mentioned, the usage of pesticides is not only limited to agriculture. Pesticides are also used in parks, on road sides and on personal lawns. These pesticides are generally referred to as cosmetic pesticides and most are available in stores. Though applying a large amount of pesticides may lead to a greener lawn, it does not always lead to a healthier lawn. Applying these pesticides also, in many cases, has the effect of killing beneficial organisms in the soil, resulting in poorer soil quality. This then leads to users having to spend more on fertilizers in order to keep their lawns looking green. This is unnecessary as there are, in most cases, alternatives available. Pesticide use on lawns has a long history. However it is only fairly recently that there has been a move toward the banning of cosmetic pesticides. As previously mentioned, there has been a move by provinces and towns throughout Canada to ban or restrict the use of cosmetic pesticides. This move by municipalities towards the banning or restricting of the use of cosmetic pesticides has its roots in the 1990s, "when the municipality of Hudson, Quebec passed a by-law restricting the use of cosmetic pesticides on public and private property..."<sup>70</sup> In the past in the Annapolis Valley there has been some protest against the use of cosmetic pesticides, notably the Kings Environmental Group (KEG) which launched a large

protest against spraying of roadsides in the early 1990s.

### Possible Futures of Pesticides and Their Alternatives Within Kings County

When we review the production of food in the Annapolis Valley, it is clear that farming is undergoing rapid and dramatic changes. Looking at the production of food and the amount of pesticides used on crops today, one can see that three different forms of farming practices emerge. These can be defined as conventional pesticide farming, organic farming and genetically modified farming. Conventional farming employs varying levels of pesticides, organic farming uses no pesticides and genetically modified farming uses around the same amount of pesticides as conventional farming but in different ways. The future of farming in the Annapolis Valley could take the form of one or even a mix of all three of these forms of farming.

Conventional pesticide farming in the Annapolis Valley, as already mentioned, has a long history. However, even conventional pesticide farming in the Annapolis Valley is changing. In the old days of farming, pesticides “used to be the magic bullet” and farmers would just add them “... as part of [their] production...”<sup>71</sup> However, this practice among farmers has changed, in part due to the rising cost of pesticides, due to the increase in oil prices, and as well the increased concern over pesticide use, brought about by studies that demonstrated the damaging effects of pesticides. Farmers in the Annapolis Valley are now using fewer pesticides, and are also using them in a more selective way. Glenn Ells a local farmer and author said, “I think you’ll find farmers don’t use pesticides unless they have to anymore.”<sup>72</sup> This trend toward using less pesticides is a rather recent trend, as Ells noted “farmers are using way less pesticides now, than when they did in the nineties.”<sup>73</sup>

This evolution has also changed how farmers spray. Many farmers in the Annapolis Valley today spray using modified spray programs. Modified spray programs begin with a group of people who scout out potential pests that might cause major problems for crops that year. A species is determined to be a pest if the number of that species found is over a tolerable level, which is determined by looking at data collected from previous years. Then that group of scouts passes on this information to farmers, who then only spray select areas of their crop to reduce the numbers of these pests. The greatest advantage of using a modified spray program is that it cuts the cost of purchasing pesticides significantly. Mr. Ells also stated that modified spray programs have “...cut their spray down by over half, way over half, which lowers your cost of production...” and as a bonus “then you are able to say that you’re on a modified spray program...”<sup>74</sup>

It also has the benefit of slowing species from building up immunities to pesticides. This is because by only spraying select areas, and not everything in sight, some of the targeted species that would normally have been killed by the pesticides are allowed to survive. These survivors, who are not immune to the pesticide, then breed with the members of the species that have survived because they developed resistance to the pesticides. The offspring of the immune and non-immune groups are then still mostly vulnerable to the pesticides first used. If however, only the immune pests survived, they would breed amongst themselves, and the next generation would no longer be affected by the pesticide that was first used. Pest management in the Annapolis Valley is moving away from the “spray everything” approach of the 20<sup>th</sup> century in favour of modified spray programs, a trend which looks to continue into the future

of conventional pesticide farming.

In the Annapolis valley within the last 20 years or so, there has been a move by many farmers from conventional pesticide farming to organic farming. There is increasing demand for organic products and “Soaring global organic food and drink sales are driving demand.”<sup>75</sup> The reasons farmers choose to move to organic farming are varied and many. They range from cutting farming costs by eliminating the expense of pesticides to concerns over healthier work environments.<sup>76</sup> The trend towards organic farming may be seen in some ways as a response to the seemingly ever increasing costs of pesticides and other farming products. However, given the ever growing demand among the public for organic goods, many farmers may choose to move into organic farming in the hopes of cashing in on this demand. The general principles of organic production include the following:

1. Protect the environment, minimize soil degradation and erosion, decrease pollution, optimize biological productivity and promote a sound state of health.
2. Maintain long term soil fertility by optimizing conditions for biological activity within the soil.
3. Maintain biological diversity within the system.
4. Recycle materials and resources to the greatest extent possible within the enterprise.
5. Provide attentive care that promotes the health and meets the behavioural needs of livestock.
6. Prepare organic products, emphasizing careful processing and handling methods in order to maintain the organic integrity and vital qualities of the products at all stages of production.
7. Rely on renewable resources in locally organized agricultural systems.<sup>77</sup>

These general principles demonstrate the environmental focus of organic farming, as well as the benefits that a move to organic farming may bring for a farmer, such as long term soil fertility, due to the prevention of the loss of biological organisms within the soil to pesticides and other chemical products. In order to market their produce as organic, a farmer must be certified. In order to become “certified organic”, a farmer must apply to a recognized certification agency. Although slightly different from province to province, organic certification is based on the Organic Agriculture Standard put out by the Canadian General Standards Board.”<sup>78</sup>

Also, organic farming is more stable and self-sufficient than conventional farming. This is largely because organic crops require no pesticides and less fertilizer input, due to increased biological activity within the soil, than conventional farming. Both pesticides and fertilizers require oil for their production and transportation, “Every calorie of food produced requires, on average, ten calories of fossil-fuel inputs.”<sup>79</sup> This is an important note because, “This is a food system profoundly vulnerable, at every level, to fuel shortages and skyrocketing prices.”<sup>80</sup> This is especially important in the Annapolis Valley, seeing as how easily farming in the Annapolis Valley can be, and has been, affected by external forces. Though organic farming is more self-sufficient than conventional farming, it does not produce as large a yield. However this certainly is not to say that organic farmers don’t make a profit. The charts in Appendix 1 compare the yield and gross return per acre of some organic vs. conventional crops. These charts only show “the fresh food market” and are based off the averages of farmers. These

charts also do not take into account “production costs associated with each method and crop.”<sup>81</sup>

Also, though organic farming is generally better for the environment, this is not always the case. Ken Green, professor of environmental management at MBS, said, "You cannot say that all organic food is better for the environment than all food grown conventionally. If you look carefully at the amount of energy required to produce these foods you get a complicated picture. In some cases, the carbon footprint for organics is larger."<sup>82</sup> This however, is only the case for a few crops. For most crops, organic farming is the more environmentally friendly option. Also, organic farming is more locally based than conventional pesticide farming. This is because organic farmers' markets tend to be locally based, and so much of the organic produce is sold close to its production location. The organic market is still relatively young and shows potential for the future.

The 19<sup>th</sup> century was the century of chemistry, the 20<sup>th</sup> century the century of physics and it looks like the 21<sup>st</sup> century will be the century of genetics. One of the forefronts of genetic research is in the food industry. Genetically modified crops offer a wide range of benefits to farmers, ranging from physically larger produce, to greater crop yields, to oddly coloured fruits and vegetables, to more resistant crops. However, genetically modified crops still require the input of pesticides like those of conventional farming. There has been a debate over whether genetically modified farming reduces pesticide use or not. At the current time, it appears that in most cases this is not the result. Charles Benbrook of the Northwest Science and Environmental Policy Center at Sandpoint, Idaho stated that, “Four years of official U.S. Department of Agriculture data are now available to test the claim that genetically modified crops grown in the U.S. have significantly reduced pesticide use. Most independent analysts working with the USDA data have reached similar conclusions; with the possible exception of *Bt*-cotton, they have not.”<sup>83</sup>

The introduction of genetically modified crops is a concern to many people. Some are concerned over the crops themselves while others are concerned over how big businesses, like the genetic/chemical giant Monsanto, are using genetically modified crops to their advantage. This is in part due to the controversial decision by the federal government to allow companies and individuals to patent genetically modified seeds. This decision allows big business to force farmers who want to plant genetically modified seeds, like Roundup Ready Soybeans, into signing unfavourable contracts. Monsanto has been criticized because “...farmers need to sign a contract with Monsanto, granting the company the right to inspect the farms at any time during the following three years and obliging the farmers to exclusively use Monsanto’s own glyphosate herbicide “Roundup” to treat their soybeans. Furthermore, contracted farmers lose the right to keep part of their harvest for next year’s sowing.”<sup>84</sup> Despite the complications that come along with their use, the introduction of genetically modified crops offers great promise for the future of farming. In many places around the world farmers are implementing these crops, and it is likely that genetically modified crops will change the agricultural industry to the same degree that the introduction of chemical pesticides did a century ago.

### Conclusion

All three of these farming practices show potential for the future. The use of pesticides in the Annapolis Valley has evolved over the last hundred years and these new farming practices may be the next step in that evolution. Pesticides were first introduced to the Annapolis Valley in

the latter half of the 19<sup>th</sup> century. The move from the inorganic to the more toxic organic pesticides following WWII, a move marked by the increased use of pesticides in general showed that there was a need for greater regulations on pesticides and it was around this time when regulations started to be introduced in Canada. Today, pesticides in Canada are heavily regulated by all three levels of government. More recently there has been a move away from pesticides in the Annapolis Valley as farmers struggle to cut costs, and are ever mindful of the potential harmful side effects of pesticide use. There are too many factors to take into account to say, for sure, which farming practice, or mix of them, will become dominant in the future of the Annapolis Valley. It seems likely that conventional farming will decline in the future relative to organic and genetically modified farming, but to what degree is uncertain. However, what can be said, with a relatively high degree of confidence, is that farming and pesticide use in the Annapolis Valley is changing and will continue to change into the future.

Appendix: Figures and Charts

Figure 1: Diagram demonstrating the benefits of selective spray programs. Source: “Refuges of Genetic Variation: Controlling Crop Pest Evolution (2 of 2),” *Understanding Evolution: for teachers*, <http://evolution.berkeley.edu/evosite/relevance/IICrefuges2.shtml>, 26 November 2009.

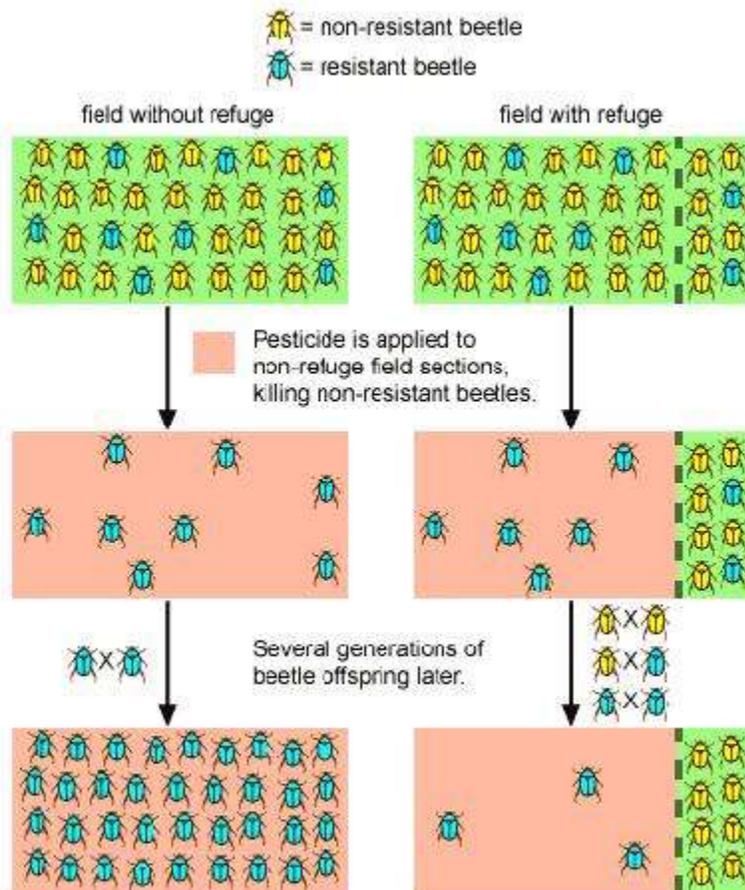


Chart 1, showing the conventional and organic profits of selected fruit crops. Source: William Parsons, "Niche market or an expanding industry? Organic fruit and vegetable production in Canada," *VISTA on the Agri-Food Industry and the Farm Community*, Statistics Canada.

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Comparison of yield and gross return per acre Organic vs. conventional production methods Fresh market sales Canada 2000 / 2003				
Fruit	Average Yield Organic lbs./acre	Average Yield Conventional lbs./acre	Gross Sales Organic return per acre	Gross Sales Conventional return per acre
Apples	13150	15500	\$4350	\$3400
Blueberries	3150	3800	\$4600	\$4200
Peaches	7000	8750	\$4125	\$4825*
Pears	14150	11100	\$5650	\$3450
Raspberries	3025	1750	\$3525	\$3300
Strawberries	3525	4700	\$3850	\$4750*

Chart 2, showing the conventional and organic profits of selected vegetable crops. Source: William Parsons, "Niche market or an expanding industry? Organic fruit and vegetable production in Canada," *VISTA on the Agri-Food Industry and the Farm Community*, Statistics Canada.

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Comparison of yield and gross return per acre Organic vs. conventional production methods Fresh market sales Canada 2000 / 2003				
Vegetable	Average Yield Organic lbs./acre	Average Yield Conventional lbs./acre	Gross Sales Organic return per acre	Gross Sales Conventional return per acre
Asparagus	1125	2075	\$2075	\$2900*
Beans	2300	7800	\$2750	\$1625
Beets	7450	13675	\$4850	\$2675
Broccoli	4750	8325	\$3000	\$3600*
Sweet Corn	6275	5025	\$1550	\$1125
Cabbage	11250	20600	\$2650	\$2900*
Carrots	21450	24800	\$6750	\$2850
Cauliflower	7900	15075	\$3200	\$4125*
Garlic	2175	1950	\$4025	\$3250
Lettuce	7800	22475	\$3500	\$5450*
Dry Onions	12075	28200	\$4925	\$3750
Pumpkins	5725	11800	\$900	\$1575*
Squash/ Zucchini	5875	8600	\$2500	\$2600*
Tomatoes	9400	12300	\$6050	\$4100

\* indicates gross sales per acre that are larger than organic returns.

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## Chapter 12: Kentville and the Cornwallis River - Jennifer Cleveland and Nicole Kennedy



*Above: Along the banks of the Cornwallis River (2003)*

### Introduction

The Cornwallis River has been integral to the growth and development of Kentville since it was founded in the 17th century. At various times, and often at the same time, it has been responsible for transportation in the region, a source of fresh water for the town, and even a sewer.<sup>1</sup> A river is very important to the existence of many living organisms. These bodies of water are highly valued when their source of food and their reliability for the irrigation of agricultural crops is considered.<sup>2</sup> The Cornwallis River has long served as an essential source of water for the farms and communities serving Kentville and the Kings County area. However, over the decades it has become a concentrated dumping ground for municipal, agricultural, and food processing wastes as it empties into its estuary, the Minas Basin. Sewage treatment facilities, fruit and vegetable canneries, a meat packing plant, and poultry processing plants are just some of the contributing sources of wastewater loading into the river.<sup>3</sup> This long history of agricultural use has caused intensification in farming practices during the last century and contributed to the loss of biodiversity as a result as well as the breakdown of the riparian areas around the river.<sup>4</sup>

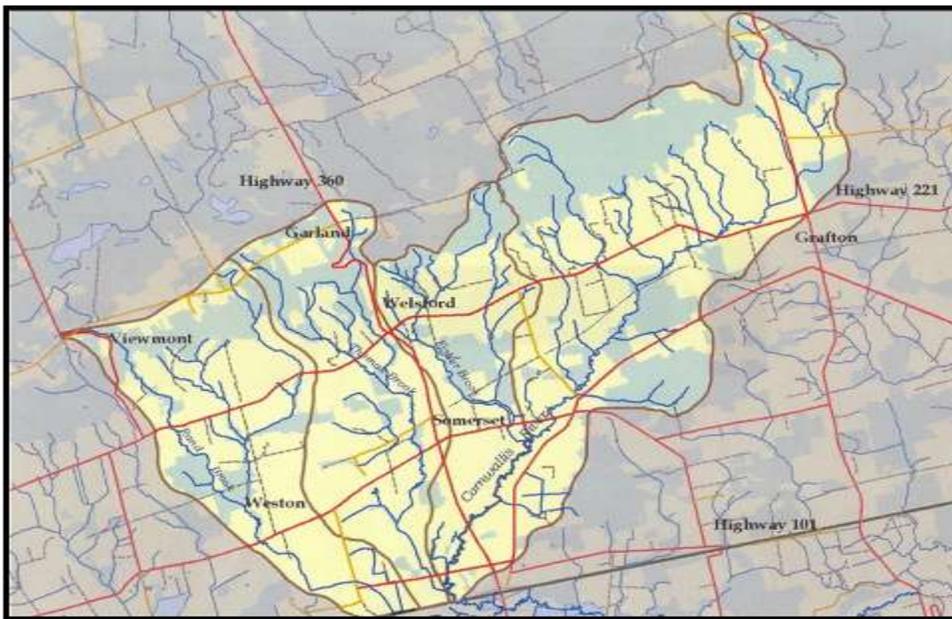


*Above: The Course of the Cornwallis River Above and Below Kentville (2009)*

## Facts about the Cornwallis River

The Cornwallis River is a meandering river that measures forty-eight kilometres in length from its source, the Caribou Bog on the North Mountain near Berwick, to its mouth at the Minas Basin near Wolfville. The upper portion of the river, The Cornwallis River Watershed, has a subdued current and flows quite sluggishly in comparison to the lower portion of the river below Kentville, which is tidal in nature as a result of the action of the waters of the Bay of Fundy. The bay causes the water in this section of the river to rise and fall in rapid succession causing the tidal marshes of the river to be heavily salinated and water exchange to occur at a much faster rate. Not very much research has been conducted on the tidal marshes of the river thus far as it is very hard to get a controlled specimen when the quantity of water changes so often. At best, the river is muddy, treacherous, and turbulent at high tide and unfriendly at low tide.<sup>5</sup>

The Cornwallis River Watershed is home to approximately 15 tributaries, the most prominent being Rand Brook, Fisher Brook, and Thomas Brook. The watershed and the headwaters that drain



*Above: The Cornwallis Headwaters and Watershed (2009)*

into the Cornwallis River cover 3260 hectares or 8050 acres of space.<sup>6</sup> Sixty percent of the watershed's land is dedicated to agriculture, thirty-seven percent is natural forest, four percent consists of residential buildings, and three percent is wetlands.<sup>7</sup> The watershed contains about 700 properties and 380 full-time residents.<sup>8</sup>

## The History of the Cornwallis River

The banks of the Cornwallis River were first inhabited by the Mi'kmaq peoples. They referred to their settlement as *Penook*, meaning "fording place," which was a reference to the natural bend in the river.<sup>9</sup> The first immigrants to settle along in the area of the Cornwallis River were the Acadians, a group of French Colonists that settled along the shores of the Cornwallis River and surrounding areas as well as in areas of New Brunswick, Prince Edward Island, Quebec, and Maine in the seventeenth century. The Acadians called the river "Grand Habitant," or "Large Inhabitant" for its

size, but and utilized the river until long after their arrival.

After the expulsion of the Acadians from 1755 to 1763, Governor Charles Lawrence issued a proclamation to the people of New England. He called for settlers who would be interested in travelling northwards to Nova Scotia to take over the land and harvest what was still viable on the flourishing fields that the Acadians had left behind.<sup>10</sup> Persons representing all degrees of potential colonists began pouring into Nova Scotia and the Annapolis Valley area with immigration beginning in earnest by 1760. In just eight years, approximately 8,000 New Englanders uprooted and moved to Nova Scotia, transforming the valley back into the budding *Above: The plaque and*



*monument dedicated to the settlement of the New England Planters at Starrs Point, a settlement on the edge of the Minas Basin (2003).*

settlement area it once was when inhabited by the Acadians. It was during this period that the English-appointed Governor of Nova Scotia, Edward Cornwallis, would establish the eventual capital of Nova Scotia, Halifax, resulting in the Cornwallis River being re-named with its current eponym in his honour.

### Transportation

The Acadians may not have recognized the Cornwallis River as an asset, but neither did the New England Planters at first. While the Cornwallis was for the most part ignored by the Acadians, the Planters quickly found that the river had an annoying feature. Literally, the river split apart their major settlements in Kings County and was an impediment when it came to agricultural and social intercourse.<sup>11</sup>

Eventually, they realized that they could use the river for traversing themselves and well as various goods back and forth between the different communities resulting in ferries basically becoming a necessity overnight; several sources claim that the later Acadians and the Planters operated a ferry on the river just below Port Williams.<sup>12</sup> The first ferry to serve the Minas Basin

ports was operated by Francis Arsenau and John Bourq in 1764.<sup>13</sup> In the 19th and 20th centuries there were several steam ferries which worked their way through the Cornwallis River, including the *Hiawatha*, the *Acadia*, the *Evangeline*, the *Prince Albert*, and finally the *Kiparwo* which continued to serve until World War Two.<sup>14</sup>

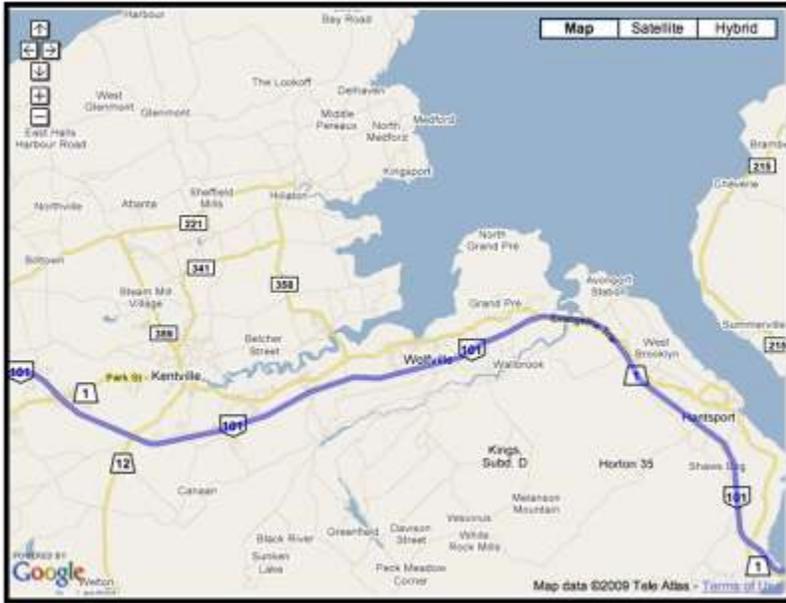


*Above: The Kiparwo in the Minas Basin. After wartime service and coastal use in Newfoundland, she was derelict in 1978. She was brought back to Parrsboro where her remains are now the stage for the Ship's Company Theatre.<sup>15</sup>*

The ferries that travelled the lower Cornwallis River were forced to deal with the unusual challenge of the tidal marshes meaning that they could only leave at certain hours of the day. If they missed the opportunity to sail when the tides were high, they would have to wait many hours until the tides went all the way out and returned again. An account from Atlantic historian Esther Clarke Wright claimed that the tidal ferry often confused tourists. Upon arriving early for the ferry, one tourist complained to the Stationmaster “There is no agent there, there is no boat there, there is NO WATER there!”<sup>16</sup> The tides of the Bay of Fundy made travelling the Cornwallis River painfully difficult at most, and tricky in the least.

The rise of road transport had a major impact on the environmental history of the Cornwallis River. Highway 101 was proposed as a two-lane freeway that would connect the East of Nova Scotia to the West starting at Bedford in the modern Halifax Regional Municipality and ending at Yarmouth in Yarmouth County . The highway was also conceived as an effort at relieving some of the automobile-related congestion that had begun to plague the valley. However, much of the traffic in the valley still exists as local residents still travel through the connecting towns to get to their destinations as an alternative to exiting out onto the highway.

Highway 101 was technically completed in the 1990s when some areas of the highway were reworked into four-lane expressways, but work has since begun again as the government works to twin the highway between exits 4 and 5, St. Croix to Windsor, and between exit 7 and 8, Falmouth and Hantsport.<sup>17</sup> Residents of the Annapolis Valley had been pushing for these improvements for quite some time due to the large number of accidents that occurred on those areas of the highway every year.



*Above: Highway 101 as it passes by the Annapolis Valley and Cornwallis River*

### The Pollution Problem

In the early 20<sup>th</sup> century, major problems with pollution started to arise. As the localized river municipalities of Berwick, Waterville, Kentville, Coldbrook, New Minas, and Port Williams all began to grow, sewage discharges into the river greatly increased. At this time, sewage treatment plants were yet to be considered so effluent was discharged directly into the river.<sup>18</sup> From then on, pollution in the river grew steadily as agricultural and residential runoff that included herbicides, pesticides and road salt drained into the Cornwallis River via storm and municipal sewers. As well, effluent pumped from septic tanks became a significant problem.<sup>19</sup>



*Above: A walk along the banks of the Cornwallis River below Kentville*

The large variety of field crops that were grown along the watershed also contributed significantly to the pollution levels in the Cornwallis River. In 1946, farmers began using DDT as their pesticide of choice due to its ability to control such a wide variety of pests. However, its use ended in 1969, when the federal government forced the removal of DDT from the shelves due to the negative effects it had on environmental health.<sup>20</sup> Additionally, DDT was found to be one of the major contaminants in the mix of pollutants that would affected the Cornwallis River via runoff.<sup>21</sup> The 1950s saw an experimental period involving all kinds of pesticides and insecticides.<sup>22</sup> However, several farmers still had stockpiles of DDT and used it in small amounts even after it was banned. This especially occurred on strawberry crops, despite the pesticide’s known harmful effects.<sup>23</sup> Beginning in the 1950s, a large variety of pesticides and herbicides, including HCH, Lindane, Alrin, Chlordane, and Furdan were being found in the Cornwallis River.<sup>24</sup> By 2002, “the river had become little more than a farm sewer”<sup>25</sup> and was ranked tenth on Earth Wild International’s list of most endangered Canadian rivers.<sup>26</sup>

In the early 1960s, public awareness increased regarding environmental issues. Following World War Two, global society became more alert to environmental issues, and was eager to take action. In 1961, the first survey report was completed by the Department of Health and Welfare with a focus on aspects of pollution in the Cornwallis River. The study examined the section of river that extended from the tributary headwaters west of Berwick to Port Williams, a distance of 24.3 miles.<sup>27</sup> The report revealed that the river was “bad’ to ‘doubtful’ for its entire length. There is no stretch that can be considered as ‘clean’. This river may be classed as grossly polluted at Berwick and this condition exists for 3.5 miles.”<sup>28</sup> The report surveyed different aspects of the river and confirmed suspicions of severe pollution throughout much of the Cornwallis. The survey concluded that the river was “grossly contaminated by both sewage and industrial wastes.”<sup>29</sup>

The pollution in the river was made evident by the tests done on the colour, turbidity, temperature and oxygenation of the water. The turbidity, or colour of a river, is darker in an active zone of decomposition,<sup>30</sup> whereas the water in an environmentally clean river is clear. Conforming to this definition of poor turbidity, the report from the Department of National Health and Welfare found that the waters of the Cornwallis River were highly turbid. This cloudy appearance was “the probable result of the tributaries carrying slaughterhouse, [and] canning plant wastes”<sup>31</sup> and domestic sewage from Kentville into the main river.

The high temperature of the Cornwallis River also indicated that the river was in a grossly polluted state. Water temperature rises when a river is carrying industrial effluent, and the “mean temperature recorded in the Cornwallis River headwaters was 14.2 degrees Celsius with a gradual increase to a temperature as high as 18.2 degrees Celsius at Port Williams.”<sup>32</sup> The high temperature of the Cornwallis River was also a significant contributor to the low oxygen levels, which is another signal that pollution was present. Dissolved oxygen in a river is one of the most important indices of the purity of the water, and is probably the primary requirement for ecological health.<sup>33</sup> Low oxygen levels indicate pollution, and with low oxygen the river is unable to self-purify. Rivers are usually able to assimilate significant quantities of pollutants and through the process of oxidation bring the pollutants to a stable state in the river.<sup>34</sup> However, without high oxygen levels this self-purification is not possible, and the river cannot stabilize itself. The oxygen profile of the Cornwallis River made apparent the effect discharges of organic debris had on the river as the debris exerts an oxygen demand on the available oxygen which “falls to a level of practical depletion at Waterville”.<sup>35</sup> Clearly, the pollutants in the river depleted the oxygen needed for the river to self-purify, and so the river was left in a highly polluted state, difficult to repair.



*Above: The Larsen Meat Packing Plant, Berwick, N.S. (Photo by James Armstrong and Kristina Morin, March 28, 2006).*

### Pollution By Industry

As noted in the 1961 survey, industries along the river were major contributors to the pollution of the Cornwallis. In the watershed region of the river there are multiple industries including fruit and vegetable packing, a meat-products processing plant, and a lumber mill, all of which contributed to effluent run-off into the river.<sup>36</sup> The meat-products plant in the area was the Larsen's Packing Plant, and it had been dumping its effluent directly into the river for decades. A provision in the survey report however brought about a major change to the dumping of effluent into the river by industries and sewers. The provision included, "pre-treatment of industrial wastes prior to discharging effluents".<sup>37</sup> Resulting from the survey in 1961, Larsen's were required to run their effluent through a treatment plant before it was discharged into the river, which helped alleviate a considerable quantity of the pollution.

### Pollution by Municipal Sewage

Immediately following the publication of the Survey Report in 1961, the Berwick Sewage Treatment plant was opened the following year. The Waterville Sewage Treatment Plant also is located along the Cornwallis River and it was last upgraded in 1990.<sup>38</sup> The plants helped to lower pollution levels as the sewage runs through a treatment process before it is discharged into the river. The Berwick plant was updated again in 1987, and in 2001 the town of Berwick announced improvements to be made to Berwick Wastewater Systems and that improvement further helped to

reduce the risk of contamination.<sup>39</sup> However, the risk of sewage pollution in the Cornwallis River still remains as sewage is pumped to the plant through a number of lift stations all of which are located along the brooks and tributaries of the Cornwallis River. Many of the lift stations are equipped with overflow pipes “which could contribute sewage to the river system during times of equipment failure”.<sup>40</sup> In times of heavy rainfall, for example, overflow can occur and then effluent is discharged directly into the river.

### Pollution by Farming

Since the establishment of municipal treatment plants, water quality in the river has improved slightly, but fecal coliform levels are still above acceptable standards. These problems persist because although the municipality is responsible for the upkeep of the sewage treatment plants, they are not responsible for monitoring and treating fecal pollution.<sup>41</sup> In the early 1980s a survey was done on the Cornwallis River to determine the level of fecal pollution,<sup>42</sup> and another study was done in 2002,<sup>43</sup> and both studies revealed higher than acceptable levels of fecal coliform counts. Not much has been done to alleviate the problem. An analysis of historical data revealed that “fecal contamination has been present at similar, or higher, levels since 1989”.<sup>44</sup> Due to the unhealthy state of the river the Cornwallis has been closed to human access on several occasions: in the late 1980s and early 1990s, for example, the river was closed entirely to human access four times,<sup>45</sup> and yet fecal coliform levels have not been reduced. Elderly residents in Kentville recall a time when they could swim in the water and drink from it freely, but now they would not even set foot in it.<sup>46</sup> Fecal coliform levels in the Cornwallis River derive from a variety of sources, such as, “runoff from pastures and croplands, the spraying of manure near brooks and streams, and runoff from manure piles adjacent to the river”.<sup>47</sup> The presence of cattle in the watershed have a significant impact on the fecal coliform levels, and being that this area is primarily used for agriculture, and in the absence of appropriate riparian-zone management policy, it is difficult to keep the cattle away from the river.

### Fixing the Problem : Government Involvement

Although the problems with pollution for the Cornwallis River still exist today, government and non-governmental organizations have been attempting and planning to clean up the river. As indicated previously, the Public Health Engineering Division of the Department of National Health and Welfare conducted the first survey regarding the aspects of pollution in the Cornwallis River in 1961. This survey brought about provisions for the treatment of sewage before it entered the river, which was a start in clearing the pollution. The Department of Natural Resources is involved in riparian zone management plans and the fencing programs. They are conducting Riparian Health Assessments, which look at the effectiveness of riparian zones along the Cornwallis River.<sup>48</sup> The department currently has no other projects with regards to the Cornwallis River, however “they are hoping to play a major role in the future”.<sup>49</sup> The Department of Environment should play a major role in the cleaning up of the river, but to date it has not done any work in the Cornwallis River among the riparian zones to prevent fecal contamination.<sup>50</sup> There is no government agency actively monitoring and restoring the river.<sup>51</sup>

### Fixing the Problem: Non-Government Involvement

There are many different groups working in the local region on the pollution problem of the Cornwallis River. The main group is the Friends of the Cornwallis River Society (FOCRS) formed in 1994. They are the only agency working on actively monitoring and restoring the river<sup>52</sup> and a

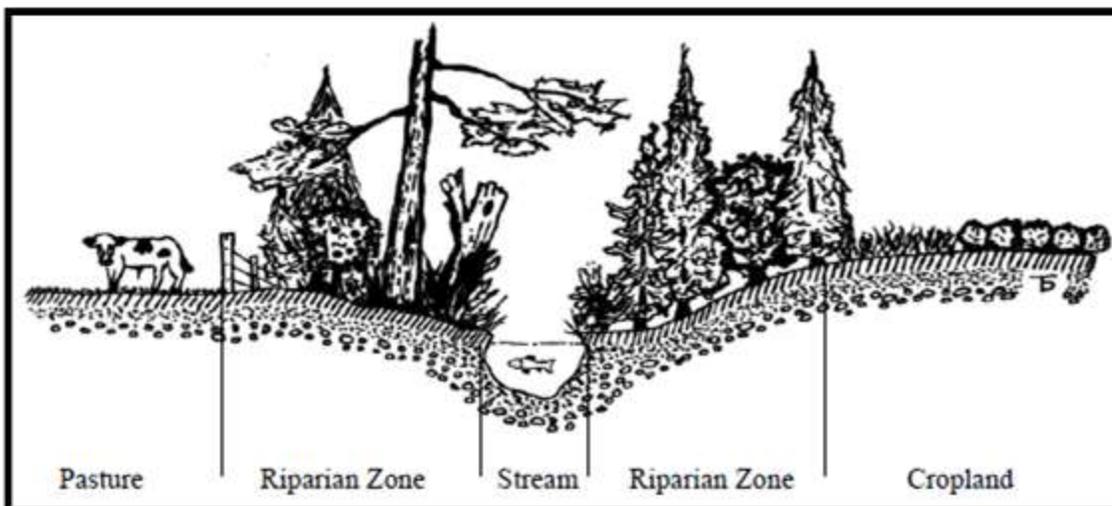
report in 1999 revealed that thanks to the FOCRS, “tributaries to the Cornwallis River are really shaping up”.<sup>53</sup> They have worked to develop riparian zones and engaged in debris removal from the river. They have also built up existing riparian zones and have implemented fencing projects to keep cattle out of the river.

Another group involved is the Growers Water Group which is composed of Valley farmers. This group is mainly concerned with water quantity for irrigation purposes however, so water quality is not a factor it considers yet.<sup>54</sup> They are however, in the early stages of development and so no major projects have been undertaken as of yet.

Finally, the watersheds of Fisher Brook, Thomas Brook and Rand Brook have developed the Upper Cornwallis Headwaters Society, a group consisting of local residents of the watershed. This group is community-based and enables institutions, groups, and individuals to identify and address issues that affect or are affected by the function of the watershed. The Upper Cornwallis Headwaters Society educates landowners on the importance of biodiversity and the role landowners can play in re-establishing riparian zones.<sup>55</sup> The plan of the Upper Cornwallis Headwaters Society is to “incorporate the local knowledge of farmers and citizens into a watershed management plan to promote biodiversity and improve water quality”.<sup>56</sup>

### Fencing and Riparian Zones

The fencing project began around the Cornwallis River as part of the Riparian Management Project suggested in 2004. It is a joint effort in King’s County between the Nova Scotia Department of Natural Resources, Nova Scotia Eastern Joint Venture Riparian Management Project, and the Friends of the Cornwallis River Society (FOCRS).<sup>57</sup> The fencing project was initiated to restrict access of cows to the river in order to reduce the degradation of the river banks and to improve the quality of the water in the Cornwallis River. The quality of the water was to improve by reducing sedimentation and fecal contamination. Farmers took an interest in this project and wanted to be informed about restricting cattle access to the river. FOCRS fenced “200 acres at the mouth of the river, and 1.5-3 km of river at other sites”.<sup>58</sup> This fencing effort is currently developing, and although FOCRS has already done a lot of work, more community involvement and more funding is needed to create an adequate reduction in fecal coliform contamination.



Above: A Riparian Zone. Source: “Best Management Practices for Riparian Zones in Nova Scotia” brochure, 2006.

Riparian zone maintenance is another way to help fight the pollution in the Cornwallis River. They are the “last line of defence to buffer water bodies from the effects of our activities on the land”, according to Agriculture Canada.<sup>59</sup> Riparian zones are based on the encouragement of the growth of trees, shrubs and plants around the river in order to restore the environment. The areas improve water quality, recycle nutrients, and renew the environment.<sup>60</sup> In times of heavy rainfall they act as “sponges”, releasing precipitation into neighbouring watercourses steadily rather than immediately, dramatically reducing the possibility of flash-flooding. Bringing in plants and trees restores oxygen to the environment around the Cornwallis River, which raises oxygen levels and lowers the water temperature which makes it easier for the river to self-purify and break down pollutants.<sup>61</sup> FOCRS has taken the lead in tree-planting efforts and in attempting to bring back the natural vegetative state of the riparian zone.<sup>62</sup> It has been a communal effort too because farmers in the area have agreed to keep the five metre wide riparian zones free from their agricultural activity for a minimum of ten years.<sup>63</sup> The Cornwallis River Riparian Management Zone project started in 2004 has since made significant attempts to reduce the pollution in the river.



*Above Left: The Cornwallis River before riparian zone rehabilitation undertaken by the FOCRS; Above Right: the same stretch of river following rehabilitation*

### Solutions

Although there have been attempts made to reduce pollution in the Cornwallis River, fecal matter still finds its way into the watershed every year. There is no strong government enforcement discouraging the pollution in the river, and strict regulations and active monitoring of pollution levels should be implemented to help restore the river. One single, clearly defined, group dedicated to testing and treating the water and preventing pollution needs to be established, with adequate funding and volunteer support. That way, the state of the river can be carefully examined and there is set responsibility to the group about maintaining the river.

Educating local residents and farmers about the problems with pollution is the key to understanding why the Cornwallis is in such a degraded state, and ways in which the problem can be solved. More fluent interaction needs to be established between scientists testing the river and the local citizens whose actions affect the river. Coordination between all municipalities along the river needs to be implemented because this is not just a problem for Kentville as all towns are affected and can offer solutions for the reduction of pollution. Government funding should also be provided as sufficient funding is needed to reduce the pollution in the Cornwallis River. There have been steps taken towards cleaning the river, but it is clear that much more needs to be done.

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- <sup>19</sup> Smith, 6.
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- <sup>31</sup> Department of National Health and Welfare, 12.
- <sup>32</sup> Department of National Health and Welfare, 8.
- <sup>33</sup> Department of National Health and Welfare, 8.
- <sup>34</sup> Department of National Health and Welfare, 8.
- <sup>35</sup> Department of National Health and Welfare, 8.
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- <sup>44</sup> Smith, 5.
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- <sup>46</sup> Michael E. W. Allen, “A Survey of Biological Oxygen Demand and Dissolved Oxygen in the Cornwallis River, King’s County, Nova Scotia.” (B. Sc. (Hons.) diss., Acadia University, 1998), 2.
- <sup>47</sup> Nelson, 3.
- <sup>48</sup> Almack, Dixon-MacCallum, 9. For a discussion of the value of riparian zones and their management, see the chapter in this volume by Sarah Story and Miranda Saroli.
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- <sup>50</sup> Smith, 31.
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- <sup>52</sup> Smith, 31.
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