

### ***Minimizing Future Flooding Risks: Deputation to Markham Council***

The damage sustained by the residents of south Thornhill following the August 19, 2005 storm exceeded \$4 million, the emotional damage is incalculable.

We, the residents of south Thornhill believe that there is information that the Township has in its purview that would shed some light on why so many homes were so badly flooded in south Thornhill on August 19, 2005.

Communicating clearly the facts and strategies to residents as soon as possible in order that they may minimize flooding risks in the future is a responsibility the Township should hold seriously. We also believe that community involvement is key towards resolving existing problems with our infrastructure and in obtaining better response from the Province with respect to applying for the Ontario Disaster Relief Assistance Program (ODRAP) (Appendix A).

We are requesting the following actions be approved by Council without delay:

- a. Organization of a meeting between the residents and Town Staff to review the survey results of the Thornhill Flood Survey.
- b. Acknowledgement by the Town of the extent of the storm damage to Thornhill by scheduling open public forum as soon as possible. The purpose of the meeting to offer residents an opportunity to share storm damage information with the Town and, if possible to include representatives from York Region, Toronto Regional Conservation Authority, and the insurance and risk management industries.
- c. Review of environmental impact on storm damaged areas in relation to: i). new development and past variances, ii). loss of pervious surfaces to the north of storm damaged areas of Thornhill including the proposed widening of Bayview Avenue to a 6 - 7 lane roadway and the widening of Yonge Street iii).the erosion of the Don River and potential consequences to area homes.
- d. Recognition of homeowners as equal stakeholders in the setting up of a committee comprised of Town staff and community representatives, including transparency in the Town's study of the adequacy of the existing sewer infrastructure and comparison to the results of the surveys conducted by the residents, and the subsequent communication of findings to homeowners in a timely manner.

### **Background**

August 19, 2005 will long be remembered by south Thornhill residents. The storm that hit Toronto and the GTA has been described as an unparalleled event; terms such as 100, 200 and 300 year storm have been used to describe the events of that August afternoon.

The storm dropped 103 mm of rain in one hour; rain gauges in Thornhill unofficially measured the rainfall at 175 mm. The storm produced torrential rainfall, golf ball- size hail, strong straight- line winds reaching up to 72 km/h and there were 1,400 lightening strikes per minute. The storm beat a destructive path along a corridor bounded by Highway 7 to the north and Sheppard Avenue to the south. (Source: Environment Canada)

On the morning of August 19<sup>th</sup>, the Toronto Regional Conservation Authority (TRCA) issued a Flood Safety Bulletin at 10:30 a.m. warning of potentially unsafe conditions around rivers and streams; at 3:15 p.m., the TRCA issued a Flood Advisory to all GTA municipalities warning of potential higher rainfall and the risk of flooding. (Source : TRCA:Watershed Management Advisory Board Meeting Minutes, Sept.23/05. Preliminary Report on Storm Flooding of August 19, 2005).

In the aftermath of August 19<sup>th</sup>, it was evident that south Thornhill sustained unprecedented residential damage. Industrial disposal bins full of water- damaged home contents were seen throughout the neighborhood; insurance adjusters and cleaning crews were working around the clock. Some families were forced to leave their homes due to structural damage and concerns of environmental dangers – primarily unacceptable levels of mold.

Our neighbours to the south of Steeles, Ward 24 (Toronto/Willowdale), fared no better. A City of Toronto survey found approximately 200 storm-ravaged homes, each sustaining on average \$100,000 in damages. The Toronto survey also discovered that backflow valves installed by homeowners to prevent sewer back-up and basement flooding were not effective.

Area residents, despite meeting with Councillor Daurio in September, were disappointed by the lack of engagement by the Town and especially a lack of acknowledgement by Town Council of the extent of the damage to area homes.

An independent group of concerned residents formed a committee to address and research the extent of residential storm damage in order to better understand what happened and what could be done to prevent future loss; it was felt that a survey of homes was paramount to understanding the extent and pattern of damage.

We were disappointed that the Town of Markham, despite surveying its losses, was not prepared to do the same type of review of residential areas. We believed that the largest insurance loss (\$500+ million) in the history of Ontario warranted a full review and decided to proceed with our own residential survey.

It was also felt that we and the Town and could learn a great deal from the observations and experiences of area residents. We were disappointed that there were no Town Hall

Meetings or open public forums scheduled, and other than two free garbage pick ups, there was little if any information from the Town.

In November, December and January of this year, the Thornhill Flood Survey of Bayview Glen and the Grandview- Henderson area conducted by the Flood Committee of Brightbay - Courtham Homeowners proceeded.

The survey information now compiled, hopefully assist Town Staff in work that is currently underway to address the problems of south Thornhill.

If the presence of LiquiForce and InsituForm trucks is any indication, there is work currently underway in our neighborhoods - but we ask what the extent of the work is, and will it be sufficient to withstand another August 19<sup>th</sup> storm.

In all likelihood, there will be other August 19<sup>th</sup> storms of varying degrees. Canada and much of North America are facing climate change and experiencing extreme weather events. According to a study (Appendix B), climate change will lead to a modest 15% increase in the magnitude of heavy rainfalls of the type that would normally be used in the design of urban stormwater infrastructure. Climate change is a reality and is a challenge facing all Ontarians.

We can either view the events of August 19, 2005 as an opportunity or be doomed to repeat the events of that terrible August afternoon.

If Environment Canada's weather models are accurate, we in Ontario are facing future weather extremes; August 19<sup>th</sup> might have been a 300 year storm anomaly but is very likely to be our future. Over the years, there have been isolated incidents of basement flooding including raw sewage when the weather was not inclement and where the Township has paid the insurance deductible in many cases. Yet, the cause(s) of the basement flooding has not been addressed since these homes continue to experience repeated incidents of basement flooding.

### Flood Survey Results

#### Bayview Glen

A total of 585 flood surveys were distributed throughout the Bayview Glen neighborhood with a return rate of 18% (103 surveys). Understandably, not everyone chose to participate, being fearful of how the stigma of experiencing a flooded basement could impact the future sale of his or her home. The returned surveys identified areas that were hardest hit by the effects of the storm; some of these areas have had previous flooding events over the years

Of those homeowners who participated in the survey, the estimated property losses were at \$2.6 million – the emotional toll is incalculable. The property losses are likely to be much higher as the \$2.6 million only represents an 18% survey return rate.

There were three types of storm damage reported in the survey, (1) basement drain sewer backup, (2) surface flooding and (3) three homes experienced both sewer and surface flooding.

Of the 103 surveys returned, 74% (76 homes) reported flood damage and 26% (27 homes) had no damage. The breakdown is as follows:

Of the 37 homes reporting basement drain sewer backup, 18 homes had a problem with raw sewage; an additional 5 homeowners were unsure if they experienced raw sewage.

Of the 103 replies, 27 (26%) homeowners reported previous flooding. Of those 27 homes, 12 reported basement drain sewer backup and 15 homeowners reported previous problems with surface flooding.

Using sanitary and stormwater infrastructure maps of the area (obtained through the Town), we have been able to map the flood damage and identify areas that sustained exceptional damage.

Bayview Glen is serviced primarily by 150mm to 250 mm diameter pipes for sanitary carriage and 250 mm to 1200 mm diameter pipes for stormwater flow.

Much of the flood damage of August 19<sup>th</sup> can be attributed to a problem of sewer capacity. Inadequate quantity controls and a minimum number of outfalls servicing the neighbourhood may also have contributed to the problem of flooding.

We must keep in mind that the neighbourhood was built in the early 1960's before building codes required more stringent stormwater management controls and the area to the north was primarily rural and undeveloped.

In addition, Bayview Glen receives stormwater and sanitary flows from the neighborhoods of Bayview Fairways, Bayview Country Club Estates and to a lesser degree, Johnsville Village. This fact in itself is not unusual; sewer lines work by gravity and Bayview Glen is located “downstream”.

Comparing the survey data and the infrastructure maps, we were able to make observations and note certain anomalies. The names of streets have been omitted from the report to protect the privacy and anonymity of the residents who took part in the survey.

Pipe diameter (and capacity) has been questioned in several areas of the neighborhood. Normally a smaller pipe will lead into a pipe of a larger diameter, however, there are a few instances where this is not the case.

1). There is a 1,200 mm storm sewer line entering Bayview Glen which appears to provide for water flow coming from the east side of the railroad. The line runs to a junction midway where it meets a 1,200 mm storm sewer. There is also a 300 mm storm sewer line that comes from the east also flows into this line. At this junction of two 1,200 mm lines and the 300 mm line, the storm sewer increases to only 1,350 mm. A 600 mm line running south down feeds into the 1,350 mm line at which point it increases in size to 1,500 mm. If the two 1,200 mm lines and the 300 mm line are surcharged, the following 1,350 mm line is incapable of taking the flow and a resultant back up is inevitable further upstream.

2). A 990 mm stormwater pipe flows into an 825 mm pipe – homes in the vicinity experienced sewer drain back-up with raw sewage and surface flooding.

3). A 675 mm pipe flows into a 600 mm on a long run of stormwater pipe line; three sanitary sewer lines, one line taking the flow from the residential sub divisions to the east, one 250 mm pipe reduces in size to a 200 mm pipe. Homes in this area have experienced previous flooding. Concern with high concentration of sanitary lines and management of stormwater flow from residential sub divisions to the east.

4). A large 450mm stormwater pipe from the east side of the CN Railway flows into Bayview Glen – we question the volume of flow and the size of the residential area serviced by this line. Homes in this area sustained damage as a result of surface flooding and sewer back-up; one property bordering the 450 mm stormwater sustained major damage to the home's foundation.

5). A 200 mm. sanitary line flows into a 150 mm line – surface flooding, sewer back up with possible raw sewage.

6). Weeping tiles installed in Bayview Glen Park – where do the weeping tiles drain? There is a 250 sanitary line running south through the park.

The adequacy of existing sewer infrastructure, the management of stormwater flow and control are of major concern to area residents. Continual development to the north and the recent proposal by York Region to widen Bayview Avenue, reducing green space and pervious surfaces, will only increase the likelihood of future flooding.

#### Grandview-Henderson area

The survey encompassed Brightbay, Rayneswood, Henderson, Grandview, Almond, Delair, Dalmeny, Pinevale, Elspeth, and Courtham. A total of 291 surveys were

distributed and 121 completed surveys were received. Of the 121, 74 houses were flooded on August 19<sup>th</sup> and 35 had been flooded previously.

The total estimated cost of the damage to the flooded residences that responded was \$1,295,000.

From sewer maps obtained from the Town, anomalies in the storm sewer system were discovered. For instance:

1) From the map, it appears that a 375 mm. pipe runs down one street and feeds into a 300 mm. pipe on another, from where they both travel to meet a 250 mm. pipe on a third, at the juncture where the 250 mm. becomes 600 mm. Ten houses on the first receiving street beyond the juncture were flooded, and are repeatedly flooded every time there is an exceptional storm. All but one of the houses on the second receiving street prior to the juncture of the 250 mm. and the 600 mm. pipe were flooded. Surface flooding was visible on the streets, themselves.

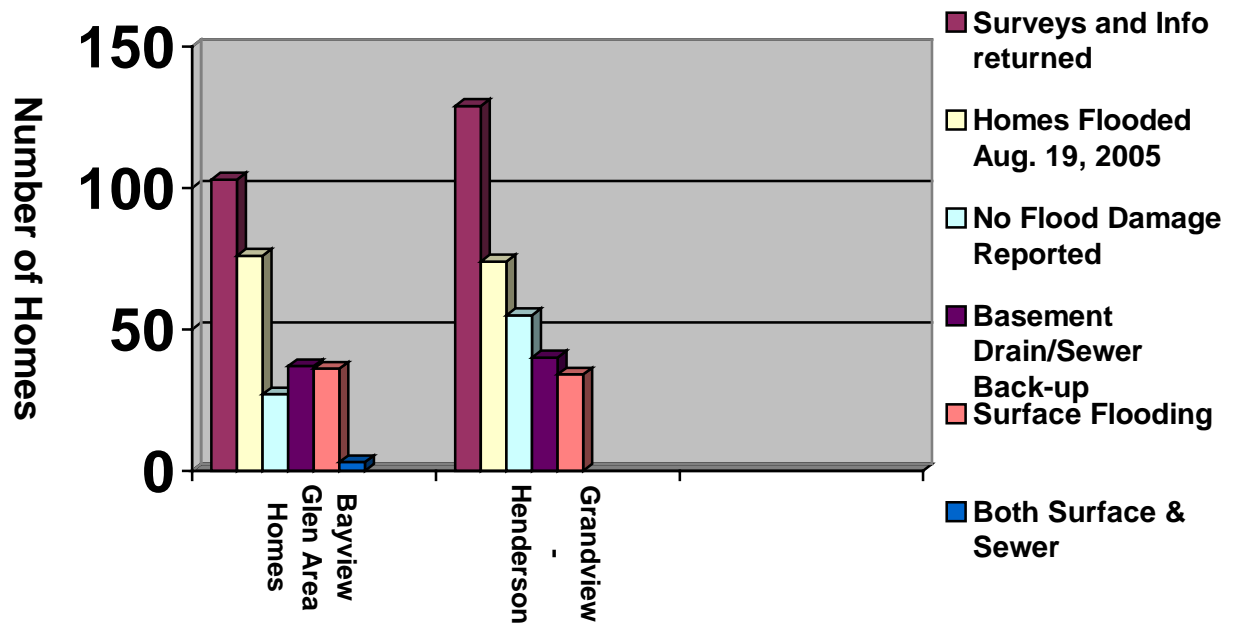
2) Most of the houses on another small crescent were flooded, where it appears that a 300 mm pipe flows into a 250 mm pipe, and the street itself was also completely flooded.

3) On another street, where it appears that a 1200 mm. pipe from one direction and a 250 mm. pipe from the other, flow into an outfall, 7 out of 9 houses were flooded, and 3 feet of water was visible on the street itself.

Stormwater should flow from smaller to bigger pipes, not the reverse. Based on this observation alone, homes in the vicinity of the above pipes could be subject to flooding until the sewer system is fixed.

Graph A summarizes the survey results for Bayview Glen and Grandview - Henderson area homes:

## Graph A: Survey Results of Bayview Glen and Grandview - Henderson Area Homes Following Aug. 19, 2005 Storm



Ward 1 (South) Thornhill also undertook a similar flood survey.

Given the fact that south Thornhill is the most downstream area in York Region and its sewers are transporting water from developments to the north, it is surprising that minimum sewer pipe sizes of 150 mm to 200 mm have been seen on the maps obtained from the Town. According to the Ministry of the Environment's Stormwater Management Planning and Design Manual 2003 (Appendix C), most of the older parts of Markham are served by stormwater management facilities designed according to less stringent criteria when the areas were originally developed. Many of the homes reporting previous flooding incidents were located at or near "T" junctions of sanitary or storm sewer pipes. The question still remains: what caused the widespread flooding in south Thornhill on August 19<sup>th</sup>?

The issue of below grade downspouts, was raised by many survey respondents. A number of homeowners reporting downspouts located below ground level were uncertain as to whether the downspouts were connected to the sanitary, storm sewers or to weeping tiles.

Residents raised concerns that some of the downspouts were connected to the sanitary sewers which could contribute to basement sewer drain backup and raw sewage. Our survey did find a problem with infiltration of stormwater flow into sanitary sewers, but we are not certain if this was a result of additional flow from downspouts or the extreme nature of the August 19<sup>th</sup> storm.

Although the Town has encouraged a downspout disconnect policy, there seems to be confusion about where downspouts should connect. Sewer By-Law 436-86 (Appendix D) appears to give the Township's Director of Engineering latitude in determining where stormwater should be discharged. The disconnection of downspouts could cause more serious problems if properties are not properly graded and able to accommodate stormwater runoff.

Some residents are contemplating the installation of back flow valves to prevent sewer backup. However, back flow valves were not effective in North York homes to the south, and have been known to cause more harm than good.

A number of building contractors and insurance adjusters have advised homeowners not to install back flow valves as these devices could cause more damage to homes in the rare event of future flooding. The reduction of flooding risk and vulnerability to water damage, was suggested as a better option than installation of back flow valves.

### Going Forward

We know that LiquiForce and InsituForm trucks have been seen in our areas, and that there is work currently underway in our neighbourhoods. However, we have been kept in the dark about the extent of the work being undertaken. At the very least, we would like to know how the work being undertaken would prevent the devastation of another storm.

We would like to mitigate our damages and the damage to our neighbourhoods by minimizing flooding risks. We would like to know what to do to minimize flooding risks as soon as possible. For example, we would like a clear message from the Town with respect to the connection of downspouts to the sanitary sewer system. Residents are unsure as to whether their downspouts are improperly connected to the sanitary sewer system, and we all know that sanitary sewer systems were not designed to transport rainwater. Similarly, the position of the Town on back flow valves needs to be communicated clearly to residents.

We are therefore requesting the following actions be approved by Council without delay:

a) Organization of a meeting between the residents and Town Staff to review the survey results of the Thornhill Flood Survey.

b) Acknowledgement by the Town of the extent of the storm damage to Thornhill by scheduling open public forum as soon as possible. The purpose of the meeting to offer residents an opportunity to share storm damage information with the Town and, if possible to include representatives from York Region, Toronto Regional Conservation Authority, and the insurance and risk management industries.

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d) Recognition of homeowners as equal stakeholders in the setting up of a committee comprised of Town staff and community representatives, including transparency in the Town's study of the adequacy of the existing sewer infrastructure and comparison to the results of the surveys conducted by the residents, and the subsequent communication of findings to homeowners in a timely manner.

The committee would be similar to the Independent Community Panel set up by the City of Hamilton recently. The objectives of the committee would be to:

a) establish a communication strategy to assist in educating the general public on issues concerning risk management, compensation, etc.

b) review i) new development and past variances issued that impacted the ability of existing sewer infrastructure to absorb water during the August 19,2005 storm and ii) the environmental impact of flood plains.

c). review and consult with the insurance industry.

d) address the cause and effect of inclement weather on the storm management/drainage systems in the Town of Markham.

Appendix E encloses the flyer that went to every household in Hamilton. Markham should follow Hamilton's lead and service its residents in a manner worthy of its citizens.

Appendix F contains comments by the residents who participated in the Thornhill Flood Survey.

Submitted by:

The Bayview Glen Residents' Association

Ward 1 (South) Thornhill Inc.

The Flood Committee of Brightbay - Courtham Homeowners

Presented by:

Toinette Bezant, Interim President, Bayview Glen Residents Association

Evelin Ellison, Ward I (South) Thornhill Residents Inc.

Hanan Jibry, Flood Committee of Brightbay - Courtham Homeowners