GENERAL COMMITTEE MEETING
JUNE 22, 2009

WEST THORNHILL STORMWATER FLOOD REMEDIATION STUDY EA

SELECTION OF PREFERRED OPTION FOR SEWER REMEDIATION

This deputation was prepared by the community members of the West Thornhill Stormwater Flood Remediation Liaison Committee, representing both Ward I and Ward II ratepayer groups of Bayview Glen Residents Association, Grandview Area Residents Association, German Mills Ratepayers' Association and Ward One South Thornhill Residents, Inc.

Since May, 2008, we, the four community representatives, have attended the meetings of this Committee regularly, have read all of the materials presented by Staff and the consultant, Clarifica. We have asked questions and done our best to represent the residents of our four communities.

Recently, out of necessity, we have had to go beyond the materials provided to us, to do our own research, to do our own analysis, and to come to our own conclusions. In spite of the explanations that Staff have provided, and in spite of our efforts to have a "meeting of the minds", we find that we deviate significantly from the recommendations provided by staff to Council. These materials are intended to provide members of Council with the reasoning behind the community members' selection of the 100 year level of protection as the preferred option for storm water remediation in West Thornhill.

BACKGROUND;

On June 2, 2009, we appeared before the Development Services Committee and presented our views on why the 100 year level of protection was the only acceptable option. We heard from Staff, at the end of their presentation, that the option they were recommending was a 5 year level of protection, in spite of the fact that all of Markham built post-1978 is at the 100 year protection level. After a significant amount of discussion, members of Council who were present that day agreed to have Staff present the option of the 100 year level of protection for West Thornhill at the second PIC. We were pleased that this decision had been made, relayed the good news to our residents, and, as there had been no opposition to it, and in the absence of any indication that the decision might change, assumed Council would simply ratify that decision at the full Council meeting the next day.

On June 3, 2009, Council met and, during the discussion of the storm sewer issue, Staff again recommended that Council select the five year protection option, for reasons which we will address in detail below. An amendment was made to the motion from the previous day that "Council confirm its position regarding Alternative #4 - the 100 year level of protection, subsequent to the announcement on the

Infrastructure Stimulus Program funding and the submission of a final recommendation of Staff." We will also discuss this amendment in detail below. Many Councillors present on June 3rd were not present the day before and had not heard our deputations. Furthermore, we were not present for the full Council meeting as we did not understand that our presence would be necessary.

REASONS FOR OUR POSITION:

(A). The guiding principle for the Town of Markham providing services to its citizens should be that which was set out by Staff in the materials provided on March 3, 2009, with respect to the West Thornhill Sanitary Sewer System. On page 5 of those materials Staff stated, "The goal is to improve the Sanitary Sewer System to provide a similar level of service across the Town."

In the "Notice of Study Commencement and Status Update" for the West Thornhill Stormwater Flood Remediation Class EA Study, 2008, it states that "...the Town of Markham initiated in February 2008 a Municipal Class EA study...to assess the preferred alternative to improve the storm system performance in West Thornhill to an acceptable level of protection."

We submit that there is no justification for a double standard in the Town, one of providing equality of protection and service for sanitary sewers, but only what is deemed to be an "acceptable level" of protection when it comes to storm sewers. An acceptable level of protection for the residents of West Thornhill is the 100 year protection enjoyed by the majority of residents in the rest of Markham. We have no interest in living in a "second class community". Nowhere on the Town's website is it revealed that "residents and businesses regularly expect flooding during the *rainy season.*"

The citizens who live in those areas of Thornhill built before 1978, are not to blame for the fact that their areas were designed with little or no controls such as stormwater ponds for overland surface flows, nor the fact that the current state of the sewer system has an inadequate capacity, all of which have contributed to sewer back-ups, basement flooding and episodes of raw sewage spills into our homes and area watercourses..

(B). The five year recommendation by Town Staff is the wrong decision for the same reason that the June 3, 2009 amendment should not be supported. They both take us down the wrong path, in that both are based on the "bottom line". To focus on whether a 100 year level of protection for Thornhill will "set a precedent" for work needed in other older areas of the Town (as suggested by Staff), or that the preferred option should be revisited after the Federal Infrastructure Stimulus Grants were announced (as suggested in the amendment), both negate the whole purpose of an environmental assessment. That purpose is to enable decision makers to seriously consider all environmental and engineering factors, based on the "best evidence available", before making a decision in the interests of the community.

While costs of the various options can be ONE factor in the decision making process, funding sources and availability cannot. Staff recognizes this distinction on page 16 of the materials dated May 13, 2009, and presented to Council in June. "Important to note that the Class EA Process does not incorporate Funding Source into the evaluation selection analysis" "Preferred Alternative solution should be selected regardless of funding availability " And yet, Staff goes on, in the very next paragraph, to suggest that Council consider selection of a minimum level of protection for Town wide upgrades and an additional level of protection for specific areas if funding or resources are available. This hardly sounds like a decision-making process based on the best environmental and engineering evidence available. In fact, it sounds like a decision-making process that could have begun and ended in May, 2008, with the Town saving $500,000 for the cost of an environmental assessment.

With respect to the suggestion that the decision Council makes on the level of protection for West Thornhill will act as a precedent for the rest of the Town, we would like to point out the following:

This is an EA for West Thornhill, not for all areas of the Town built before 1978.

Since that is the case, focusing on costs for other areas is inappropriate.

Since that is the case, we have no evidence before us for other areas, especially no evidence of flooding with the severity and frequency as experienced by West Thornhill.

Since that is the case, any figures regarding the cost of remediation in other areas are largely conjecture. Issues examined in the EA process are too complex to simply multiply the costs of remediation in West Thornhill by 3 and come up with a total. (For example, West Thornhill has one storm pond, while the rest of Markham has 137. (Source: Stormwater Management Strategy, Development Services, June 2007) This reason alone could explain the severe flooding that occurs in Thornhill, and could also dictate that remediation in other areas will be less expensive. Remediation of other areas should be based on need, and as identified through their own EA processes.

(C). The third reason why the five year protection level recommended by Staff is not the appropriate option is because it is barely an improvement over what we have, it is already out of date as a viable option, and because it does not take into account climate change. Again, Staff pays lip service to the reality of climate change but does not follow through with a recommendation in keeping with the new reality.

On page 22 of Staff materials dated November 11, 2008, in trying to provide some historical context for the situation facing West Thornhill, it is noted that the surface imperviousness (due to development over the years) has increased from 2% to 40%, and that "significant increases in storm runoff [are] expected."

Well, significant increases in storm runoff, due to significant increases in the intensity of storms, are here. In appendix 1, Design Storm Events, March 2009, we see that a five year storm, (the level of protection recommended by Staff), produces 55 mm of rain per hour. A ten year storm, beyond the level of protection recommended by Staff, dumps 67 mm of rain per hour. Appendix 2, a chart of rain monitoring prepared for this study in 2008, shows that there were two storms in the 10 year storm range within three days of each other! On July 19, 2008, 62mm and 67mm of rain fell at two testing stations within West Thornhill. Three days later, on July 22, another 62mm of rain fell at the Leslie Pumping Station.

According to Gord Miller, former Environment Commissioner of Ontario, there were 100 year storms in the GTA in the years 2000, 2002, and more than a 100 year storm on August 19, 2005. We have provided additional statistics from other municipalities in Appendix 3, "Adapting to Climate Change".

The author of the paper notes:

> "Flood management, including flood plain mapping, dams, stormwater systems, and municipal plans, are based on historical rainfall and flooding events. However, under the climate change scenario, historical events may be a poor predictor of future events. More frequent and intense precipitation events in Ontario are expected."

Information from Natural Resources Canada reveals that between 1985 and 2005, a twenty year period, there were 8 storms of a 25 year storm event or higher in the Toronto area alone, all resulting in severe flooding.

In appendix 4, a chart provided by Staff "Modeling Existing Conditions--High Flood Potential Segments", we see that in a 10 year storm event 53% of the sewer segments in Thornhill have a high flood potential. In a 25 year storm event 67% of sewer segments in the study area have a high flood potential. In a 100 year storm 79% of sewer segments have a high potential to fail.

Appendix 5 contains photographs provided by Thornhill residents showing evidence of actual storm sewer failures. The first photograph was taken on June 23, 2008, on Laureleaf Road, in Thornhill. The Staff's chart (appendix 2) of rain monitoring on that exact day indicates that at the nearby Thornhill Community Centre, (a few blocks from where the photo was taken), 28 mm of rain fell. That is less than a 2 year storm event, 11 mm less. Where two year storm sewers should have handled the rain event easily, they failed to perform up to the standard for which they were designed. Why?

The second and third photographs were taken on Almond Avenue on August 19, 2005, and show raw sewage that surcharged into a residents basement and bath.

In light of the evidence presented, how can a 5 year level of protection be considered "acceptable"? Under these circumstances we predict that very few residents of West

Thornhill will agree to anything less than a 100 year level of storm protection. Would you?

PROPOSAL ON COSTS:

In the presentation to Council on June 3, 2009, Staff suggested that a five year level of protection should be selected as the appropriate option and then upgrades could be made over time. Although we clearly disagree with the first part of the recommendation, we do agree that implementing the preferred option of a 100 year level of protection could be phased in over time. This is exactly what the Town is doing with the remediation required for the sanitary sewers in Thornhill. Right now there is a work plan going forward to 2013. Since we know that it is more efficient and effective to work on the two sewer systems in conjunction with each other, and since there is a clear construction advantage and possible cost savings in remediating both systems at the same time, we suggest that staff develop a work plan, also going forward to 2013 or 2014, to remedy the storm sewer problems. (The importance of working on both systems in a coordinated fashion was highlighted during a discussion with a Town employee who was at Bayview and Steeles after the August 19, 2005 storm. He reported that after the storm surge had passed, not only was there raw sewage in evidence over a large area, there was even toilet paper hanging from the trees!)

We now refer you to appendix 6, the excellent cost analysis done by Joel Lustig in the Town's Finance Department. Using either option 1 or option 3, the cost to each household in Markham would be approximately $80.00 per year over the next 5 years to bring Thornhill up to a 100 year level of protection in the storm sewer system. That's less than $14 on a bi-monthly bill.

COSTS TO MUNICIPALITIES DUE TO LACK OF REMEDIATION:

In 2001 and 2002 the City of Stratford experienced heavy rain events that caused widespread and substantial residential and commercial damage. As a result, despite its small population size (about 30, 000), the City has adopted a 250 year storm standard and is investing $70 million in remediating their stormwater infrastructure. (Rickett et al., 2006)

The costs to rectify infrastructure deficiencies after the Peterborough flood of July 15, 2004 could reach $200 million. (Klassen and Seifert, 2006) The consultant's report identified three deficiencies which contributed to the extensive damage in Peterborough; (1) most of the City's storm system is designed to a 2 year storm event, (2) lack of overland routes for excess stormwater runoff, and (3) excessive groundwater seeping into the City sewer system. These are the same conditions that currently exist in Thornhill; all we need to add is "water".

COSTS TO RESIDENTS

Not only can the Town incur enormous expenses if appropriate remediation is not taken, but the residents themselves will continue to experience all of the costs associated with repeated floods in their homes. Some of our residents have been flooded five and six times; it is no longer even possible for them to purchase property home insurance. Even residents whose homes have not been flooded are required to pay higher premiums solely because they live in a "flood prone" area, and some report increases in insurance premiums as high as 250%.

These expenses, however cannot compare to those incurred through the necessity of ripping out basements, right down to the dry wall and subfloor. Such extreme measures are required by insurance companies in order to prevent future claims for mould infestation and e-coli infections. Any piece of furniture that has been touched by the flood water must be thrown out. Going through this process several times has even forced some of our neighbours to move out of Thornhill.

As difficult as it may be to budget for the sums of money required to upgrade Thornhill's storm sewer system to the 100 year level of protection, the future costs for the Town and for residents will surely escalate if such remediation is not undertaken. The expression "a penny wise and a pound foolish" comes to mind.

Submitted by: Toinette Bezant, Bayview Glen Residents Association
Evelin Ellison, Ward One South Thornhill Residents, Inc.
Marilyn Ginsburg, Grandview Area Residents Association
Eileen Liasi, German Mills Ratepayers Association

END NOTES

(1) Exclusion of Critical Information

From the beginning of this study we have disagreed with the exclusion of certain information that we considered to be critical. The issue of ground water was not included in the study's terms of reference, which we objected to from the outset. West Thornhill is built over many buried streams and the ground water table for the entire area is very high, so high in fact, that in some parts, it is above ground level. One resident has a stream running through his basement every time it rains. The ground cannot absorb as much water as other locations, since the water from the surface quickly meets the water under the surface and further absorption is impossible. These facts play a major role in our flooding problems.

The very high water table also causes infiltration of ground water into the sanitary sewers, which can surcharge into people's basements, leaving them with raw sewage and health dangers from e-coli and mould infestation. The high level of ground water is obvious in many of our residents' homes, as evidenced by their use of sump pumps

24 hours a day.

We have never agreed that an Environmental Assessment, which is supposed to use "best available evidence", could come to a valid conclusion when such a major area of study was excluded. Ground water studies and natural overland flow routes are important to the remediation of the sanitary and storm sewer systems. They are also important to our understanding of the potential success rate of some of the remediation methods being suggested.

(2) Concerns For The Natural Environment.

Another area in which we have approached this study differently than Staff is in the analysis of factors impacting the natural environment. Staff has focused on environmental concerns such as the possible increased stream erosion in a few areas where greater amounts of concentrated storm water will be transported into the stream by larger sewer pipes. This is currently what happens in areas of Markham with the 100 year level of storm protection.

Concerns were also expressed by Clarifica over greenhouse gases created by construction equipment during remediation and the possibility of construction mud being washed into creeks. However, there are control and mitigation measures in place for these problems.

Some members of Council have expressed concern about the suggestion that storm water ponds be created in West Thornhill, for fear that they will become contaminated with toxins and pollutants. There are 138 storm ponds in Markham, and the toxins and pollutants that end up in them, are currently ending up in Thornhill residents' basements and in our rivers.

We believe that through appropriate remediation of both the sanitary sewer and storm sewer systems we can improve the health and well being of both the natural and human environment. .

APPENDICES

Appendix 1: West Thornhill Stormwater Flood Remediation Study – Design Storm Events, March 23, 2009.

Appendix 2: West Thornhill Flood Remediation Study – Monitoring, November 11, 2008

Appendix 3: Flooding Hazard Prevent and Mitigate or Compensate Rehabilitate, Environment Commissioner of Ontario (ECO)

Appendix 4: Thonhill Flood Remediation Study, Modelling Existing Conditions- High Flood Potential Segments, November 11, 2008

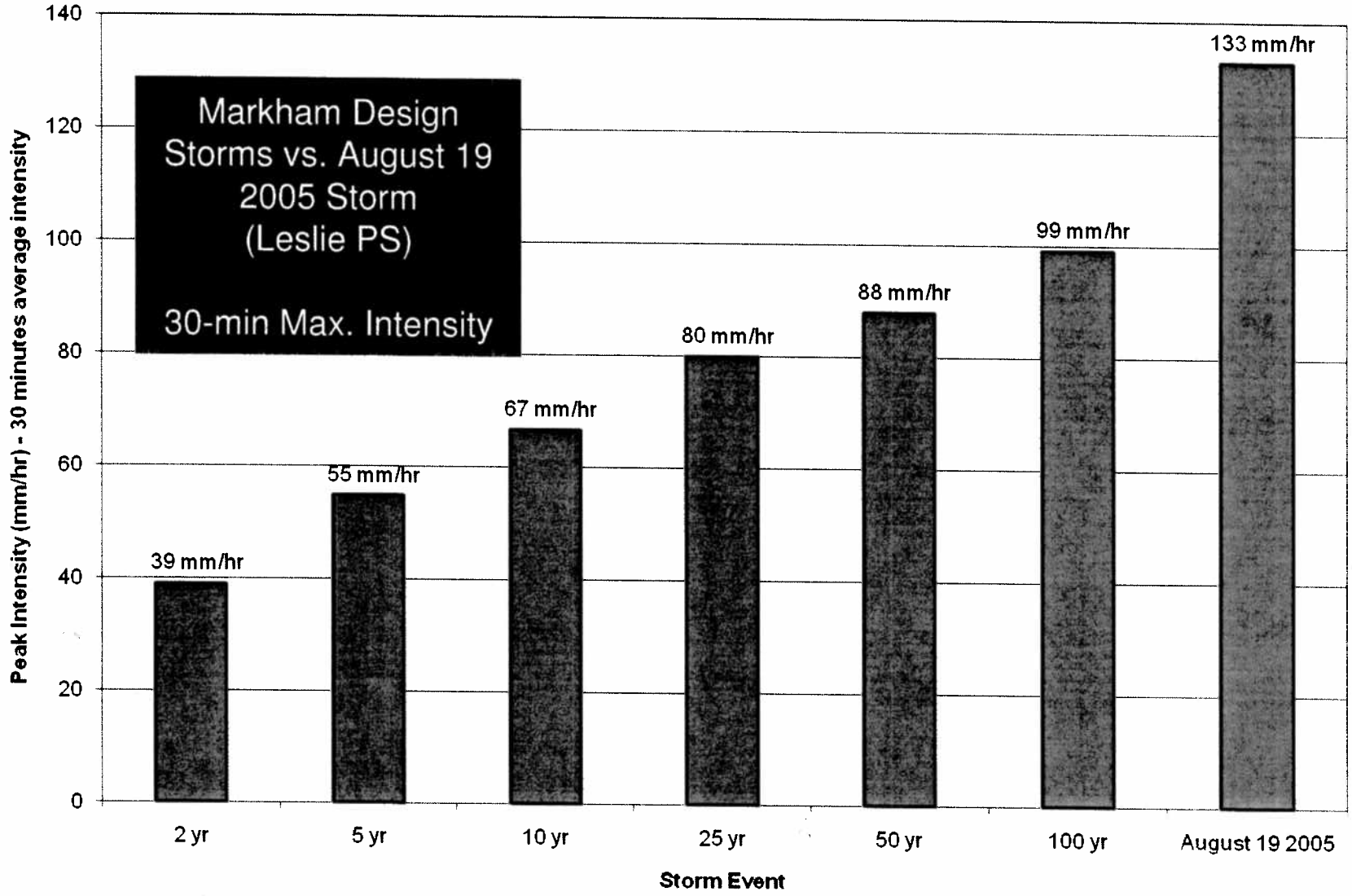
Appendix 5: Photographs. (1) Laurleaf Road, surface flooding June 23, 2008. (2) Almond Avenue residence, August 19, 2005, raw sewage back-up.

Appendix 6: Funding Options for the West Thornhill Stormwater Flood Remediation, prepared by Joel Lustig, Town's Finance Department, May 14, 2009.

Appendix 1

Appendix 1

Design Storm Events



Appendix 2

Monitoring

1. Eight flow monitoring stations
2. Four rain gauges
3. Captured at least 31 rainfall events

Storm Date	Precipitation Station (mm)			
	Holy Cross Cemetery	Leslie Pumping Station	Liberty Site	Thornhill Community Center
May 3, 2008	43	47	41	35
May 18, 2008	13	13	13	13
June 3, 2008	13	13	12	5
June 9, 2008	18	N/A	19	13
June 13, 2008	15	N/A	18	10
June 15, 2008	26	N/A	35	11
June 21, 2008	19	N/A	48	41
June 23, 2008	4	N/A	39	28
June 26, 2008	N/A	12	8	3
June 28, 2008	12	26	39	20
July 8, 2008	N/A	15	15	5
July 19, 2008	40	62	67	55
July 22, 2008	23	62	38	34
July 26, 2008	N/A	14	15	6
August 5, 2008	6	12	12	6
August 9, 2008	31	31	35	31
August 15, 2008	2	5	8	16
August 18, 2008	2	2	5	3
August 28, 2008	3	3	4	4
September 3, 2008	7	7	4	5
September 6, 2008	15	7	11	13
September 7, 2008	10	7	7	8
September 8, 2008	22	21	22	20
September 9, 2008	4	3	7	4
September 13, 2008	32	25	27	25
September 14, 2008	13	13	13	13
September 30, 2008	16	N/A	22	17
October 8, 2008	12	N/A	11	12
October 15, 2008	6	N/A	5	5
October 20, 2008	9	N/A	8	9
October 25, 2008	14	N/A	14	13

Adapting to climate change

Flood management, including flood plain mapping, dams, stormwater systems, and municipal plans, are based on historical rainfall and flooding events. However, under the climate change scenario, historical events may be a poor predictor of future events. More frequent and intense precipitation events in Ontario are expected and anecdotal evidence suggests that municipalities have already experienced such events:

- Since 1996, three 100-year storms have hit the Ottawa area and the village of Carp to the west of the city.
- In 2002, the ""49th Parallel Storm"" in northwestern Ontario exceeded the rainfall depth of the Timmins Storm by a factor of at least two.
- In 2002, Peterborough experienced a 100-year storm, and just two years later, a 290-year storm in 2004.
- In 2004, Hurricane Frances dumped up to 150 mm of rain in 12 hours on eastern Ontario.
- On August 19, 2005, a 100-year storm dumped almost 175 mm of rain in less than one hour across the northern sections of the City of Toronto and York Region.

By 2090, Environment Canada estimates that the 100-year storm will be experienced every 50 years, based on a projected 15 per cent increase in rainfall across Ontario. Infrastructure with long service lives, such as dams, combined sewer systems and stormwater systems, are at risk of experiencing storms that exceed their capacity to handle the floodwaters. A recent climate change study included a recommendation that designers of future stormwater structures should assume storms that are 15 per cent larger than those experienced currently.

An increasing number of experts have begun to question the appropriateness of planning policies that allow development and site alteration in flooding hazard areas, and to raise concerns about aging infrastructure. Some are also questioning the appropriateness of relying solely on historical storm events to design infrastructure. Meanwhile, major infrastructure decisions are still being made based on historical data, and municipalities and CAs are struggling to prohibit development and site alteration in flood prone areas. The ECO urges MOE, MNR and MMAH to update current regulations, policies and guidelines so that today''s decisions don''t add to an existing legacy of infrastructure and development that will not be able to handle or withstand projected flood events.

Link: Below -- Source: Flooding Hazards Prevent & Mitigate or Compensate and Rehabilitate : Reconciling our Priorities, Environment Commissioner of Ontario (ECO),

Modelling Existing Conditions – High Flood Potential Segments

Appendix 4

Event	High Flood Potential Due to Surface Flows (Major System)		High Flood Potential Due to Sewers (Minor System)	
	Number of Segments	Length (m)	Number of Segments	Length (m)
2yr	50 (2%)	3,409 (4%)	159 (8%)	6,679 (8%)
5yr	67 (3%)	4,364 (5%)	654 (32%)	26,088 (32%)
10yr	90 (4%)	5,234 (6%)	1068 (53%)	42,791 (52%)
25yr	159 (8%)	8,563 (9%)	1364 (67%)	54,374 (66%)
50yr	200 (9%)	10,498 (12%)	1498 (74%)	59,860 (73%)
100yr	268 (13%)	13,822 (15%)	1604 (79%)	63,619 (78%)
August 19 2005	415 (20%)	19,772 (22%)	1686 (83%)	67,448 (82%)

Roads with high flood potential:

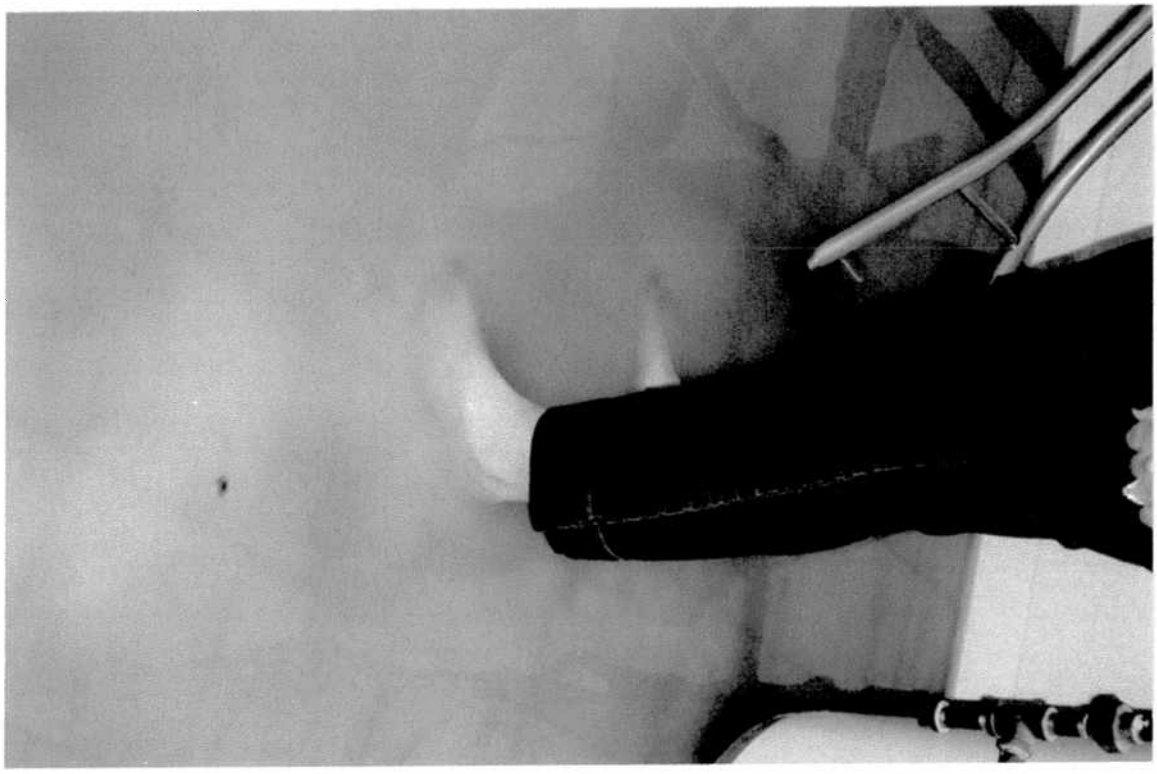
4% to 15% (2 to 100 year storm)

Sewers with high flood potential

8% to 78% (2 to 100 year storm)

Appendix 5.1

Appendix 5.2



Appendix 6

Town of Markham
Funding Options for the West Thornhill Stormwater Flood Remediation
May 14, 2009

Options:
1. Flat rate
2. Additional surcharge based on consumption
3. Tax rate increase
4. Local Improvement Section 391

Option 1: Flat Rate

Assumption: *(Residential:ICI rate ratio - 1:15)*	5 year protection $17M over the next 5 years Growth Assumption 0	5 year protection $17M over the next 5 years Growth Assumption 1800	25 year protection $33M over the next 5 years Growth Assumption 0	25 year protection $33M over the next 5 years Growth Assumption 1800	100 year protection $40M over the next 5 years Growth Assumption 0	100 year protection $40M over the next 5 years Growth Assumption 1800
Additional Flat Surcharge/month - Res.	$2.92	$2.76	$5.66	$5.35	$6.86	$6.49
Additional Flat Surcharge/year - Res.	$35.00	$33.09	$67.95	$64.24	$82.36	$77.86
Additional Flat Surcharge/month - ICI	$43.75	$41.36	$84.93	$80.30	$102.95	$97.33
Additional Flat Surcharge/year - ICI	$525.04	$496.37	$1,019.20	$963.55	$1,235.39	$1,167.94

Further analysis on a potenial tiered rating system for the ICI accounts.

Option 2: Surcharge based on forecasted consumption

	5 year protection $17M over the next 5 years Growth Assumption 0	5 year protection $17M over the next 5 years Growth Assumption 1800	25 year protection $33M over the next 5 years Growth Assumption 0	25 year protection $33M over the next 5 years Growth Assumption 1800	100 year protection $40M over the next 5 years Growth Assumption 0	100 year protection $40M over the next 5 years Growth Assumption 1800
Additional Surcharge required	$0.1056	$0.0998	$0.2049	$0.1938	$0.2484	$0.2349
Impact average /year - Res.	$36.10	$34.14	$70.08	$66.28	$84.95	$80.34
Impact to top 10 ICI/year	$11,896.90	$11,251.73	$23,093.98	$21,841.60	$27,992.70	$26,474.67
Impact to next top 90 ICI/year	$3,937.48	$3,723.95	$7,643.35	$7,228.85	$9,264.67	$8,762.25
Impact to the remaining ICI/year	$313.52	$296.52	$608.60	$575.60	$737.70	$697.69

Option 3: Tax Rate Increase
One time tax increase

5 year protection $17M over the next 5 years Year	5 year protection $17M over the next 5 years Tax Rate Incr.	25 year protection $33M over the next 5 years Year	25 year protection $33M over the next 5 years Tax Rate Incr.	100 year protection $40M over the next 5 years Year	100 year protection $40M over the next 5 years Tax Rate Incr.
2010	3.23%	2010	6.27%	2010	7.60%

Option 4: Local Improvement Section 391
property owners in West Thornhill - 8,495

5 year protection $17M		25 year protection $33M		100 year protection $40M	
Cost/House	$2,001	Cost/House	$3,885	Cost/House	$4,709
Over 5 years	$2,311	Over 5 years	$4,487	Over 5 years	$5,438
Over 10 years	$2,591	Over 10 years	$5,031	Over 10 years	$6,098
(with interest 5%)		(with interest 5%)		(with interest 5%)	