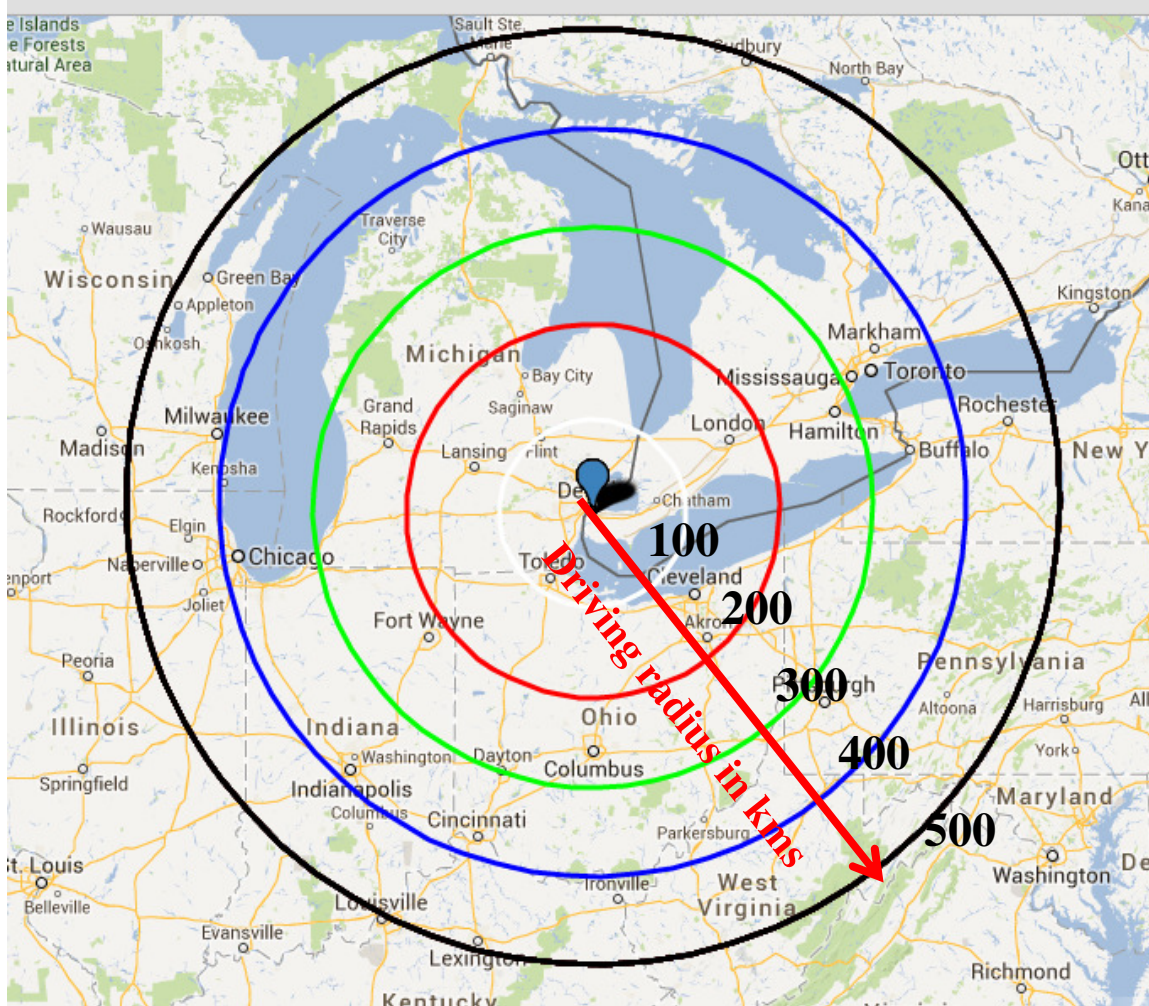


Basement Flooding Windsor's Approach to the Challenge

A Presentation of
Our City's Reduction Measures and Successes



Windsor, Ontario







Culminating Rain Events

June 5 & 6, 2010

90 mm of rain fell in Windsor between 11:00 pm June 5th and 3:00 am June 6th

November 29, 2011

75 mm of rain fell

187.4 mm in November

111.9 mm more than our normal

In 2011 (Windsor's wettest year on record)

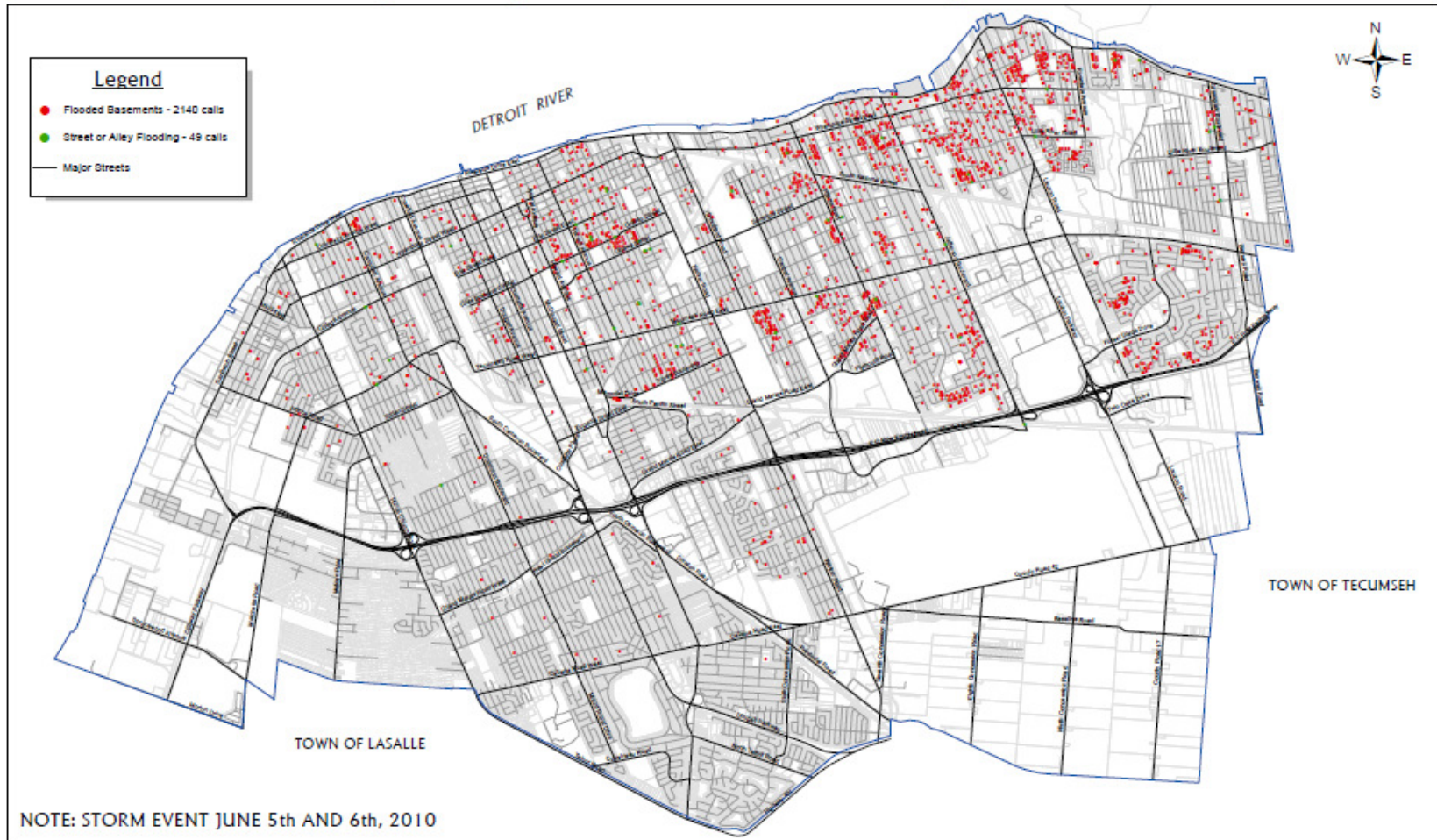
1,568mm of rain fell compared to the average annual rainfall of 844mm



June 2010 Event

2,281 flooded basement calls to 311

311 flooding calls inputted into database as of 7pm June 14, 2010

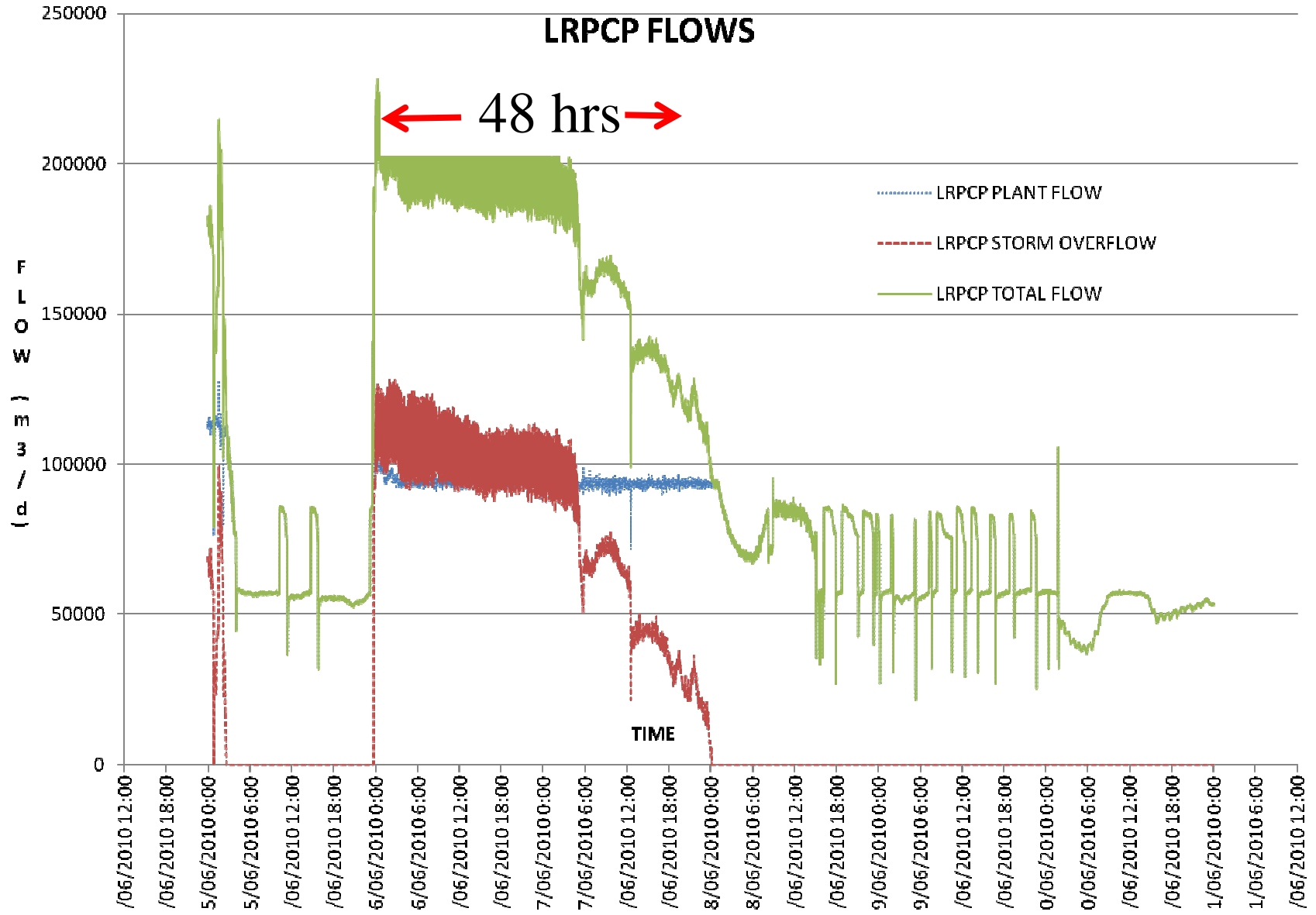


June 2010 Event

Flood Survey



- **1,276** homes visited or surveys submitted
- **49%** of homes had downspouts connected
- **4.7%** of homes had the power go out
- **90%** of respondents say water came up through floor drain or plumbing



The aftermath – June 2010 Event



445 tonnes of *extra* garbage as a result of flood damage

•Lots of press coverage



- How did this happen?
- Why did this happen?

•Pressure to do something to prevent it happening again.

- What can be done?



Windsor's Sewer Infrastructure

- 226 km of combined sewers and 24.5 km of over/under sewers.
- In the 80's installed sanitary sewers to eliminate septic tanks
- Aging infrastructure & private drain connections
- Many homes have crossed/mixed connections
- Annual Capital Sewer Program



Solution?

Approximately \$700 to \$900 million worth of work is required to separate all of the over-and-under and combined sewers and complete the Priority 1 storm relief sewers. (**long-term**)

What can be done in the **short-term**?

What is the best “**bang for the buck**”.

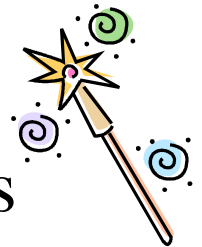


AT SOURCE MEASURES (\$)

VS

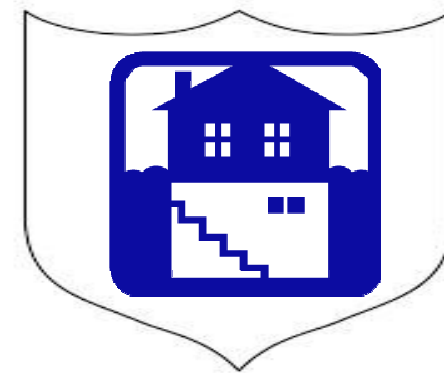
LARGE PROJECTS (\$\$\$\$)

- There is no instant or magic solution
- During the 2012 Budget Process, \$4,000,000 was allocated towards a 7-point program



Short-Term Measures Implemented (At Source)

- In 2011, implemented a Basement Flooding Protection Subsidy Program (for existing residential properties)
- \$500,000 per year allocated



Basement Flooding Protection Subsidy Program

Eligible Amounts

Install Backwater Valve(s) (Licensed plumber required)

Up to 80% of cost, (\$1,000 maximum)

Install sump pump to disconnect foundation drains to floor drains

Up to 80% of cost, (\$1,750 maximum)

Install backwater valve and sump pump

Up to 80% of cost, (\$2,800 maximum)

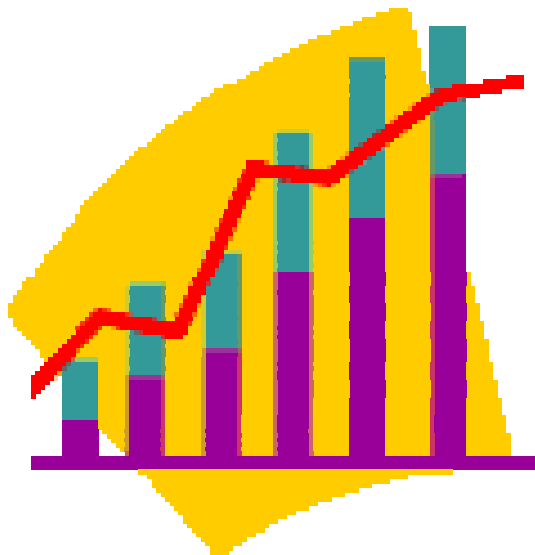
Disconnect foundation drains from floor drain and/or dye testing and camera work as required.

Up to 80% of cost, (\$400 maximum)

THE MAXIMUM ELIGIBLE SUBSIDY LIMIT IS \$2,800 PER HOME/UNIT.

Some advice:

Expect upward pressure on pricing and lots of interest from private contractors



TK WATERPROOFING *When Foundations Buckle And Basements Flood, Experience Counts*

Spring moisture problems and flooding have come early to local homeowners.

"This winter's continuous freeze/thaw cycles are terrible for basements," says Tom Krizan, owner of TK Waterproofing. "Winter was prefaced by a very wet fall and now the excess moisture is trapped in the soil around house foundations. Basements are flooding. Our company has been really busy, repairing one buckled and cracked foundation after another. Thankfully, our loyal customers were patient during the rush demand."

When confronted with a cold wet basement, every homeowner understandably wants the problem resolved properly and immediately. "Started by my father, TK Waterproofing has been around so long that we know which methods are cost-effective and won't fail over time. Our workmanship has been proven in Windsor-Essex County homes for more than 30 years. We're not trying out new techniques in your basement," Tom says.

TK Waterproofing's experienced team finds the source of the trouble, inside and outside of the home, and corrects it. Their quality work includes rectifying bowed foundation walls; removal of damaged studs and drywall; repair of underground sewers; and replacement of sewer lines. Appreciating that flooding and other problems seldom occur at a time convenient to the homeowner, TK Waterproofing is on call for emergency services during holidays and after hours.

One tried and true solution delivers a one-two punch to stop flooding in high risk homes. First, TK Waterproofing's master plumber installs a sewer backwater valve to prevent the municipal sewer from backing up and dumping waste water indoors during a heavy rainfall

or sudden thaw. The second step is the installation of a sump pump in the basement. "This combination lets waste water out without letting sewer overflow in, so if you get six inches of rain in a few hours, your home won't be flooded," Tom explains. "In most situations, it's a \$2,000 fix as opposed to a \$30,000 repair after a major flood. Some homeowners in our area who have experienced repeated flooding are now being dropped by their insurers. This is a proactive fix that protects you and your home. Owners of homes in Windsor are currently eligible for an 80% rebate on a new backwater valve and sump pump system."

When foundation walls are sinking or buckling, TK Waterproofing uses methods approved by engineers to restore structural integrity. "We collaborate with our partner engineers to determine what is best for your home. It may be strengthening the foundation by adding structure with steel supports secured inside," says Tom.

"If a bowed or cracked foundation is built from hollow concrete block, we can straighten it up. Then we will drill small holes into the blocks so we can fill the core with cement. The new cement connects blocks to each other internally, creating walls that are stronger than they have ever been."

Another service provided by TK Waterproofing is locating buried and hidden sewer pipes inside and outside a residence or business. "With our locator system, we can trace lines and find underground pipes on private property, so you will know where they are before you begin a big construction project," Tom says.

If that project is renovating your kitchen, bathroom or newly waterproofed basement, Tom, who is master carpenter, and his team can handle the entire project, from design concept to finish. A home theatre, guest suite, home office, fitness studio, music room...once your basement is dry and secured against flooding, your home's full potential can be realized.

STOP FLOODED BASEMENTS!

Install a sewer water back-up valve today.

In existing homes experiencing basement flooding due to sewer backup, an effective prevention strategy is to install a sump pump and a back flow valve. You may qualify for 80% reimbursement from the government.



INSTALLATION PROCESS



Call today to have one installed before the next big storm!

519.738.6677 | cell 519.981.1092 | fax 519.738.3091
1306 Concession 3, Harrow, Ont
tkri@yahoo.com
www.tkwaterproofing.ca

TK
WATERPROOFING



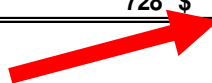
Tom J. Krizan
OWNER

Slowly Chipping Away at the Problem...

Basement Flooding Protection Subsidy Program

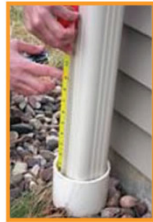
Table 1. Basement Flooding Protection Subsidy Program
 Number of Applications by Electoral Ward With Eligible Work as Determined Upon Courtesy Inspection
 As of: May 7 2013

Electoral Ward	# of Applications with Eligible Work	%	# of Applications Expired (*)	# of Remaining Applications	# of Subsidies Paid (as of May 7, 2013)	\$ Subsidies Paid (as of May 7, 2013)	# of Remaining Applications with No Subsidy Paid (as of May 7, 2013)
1	257	23%	42	215	210	\$ 342,222	5
2	63	6%	21	42	40	87,355	2
3	74	7%	18	56	47	106,336	9
4	116	10%	39	77	64	155,300	13
5	89	8%	22	67	59	118,164	8
6	271	24%	92	179	164	311,179	15
7	111	10%	36	75	70	98,580	5
8	81	7%	28	53	46	90,042	7
9	32	3%	13	19	17	18,811	2
10	24	2%	11	13	11	23,960	2
Total	1,118	100%	322	796	728	\$ 1,351,949	68



(*) Note: Applications are considered to be 'expired' if a Building Permit has not been taken out within 60 days of the Courtesy Inspection

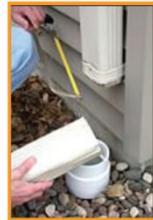
Downspout Disconnection Program



How Does it Work?

- 23cm is measured from where the downspout enters the sewer connection.

1



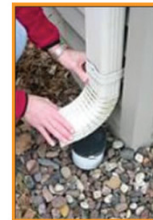
- The downspout is cut.

2



- The sewer standpipe is capped, preventing water from going in.

3



- The downspout is inserted INTO the elbow (if the elbow is put into the downspout it will leak).

4



- A downspout pipe extension is attached. A splash Board may be used to prevent erosion.

5

Expanded the downspout disconnection program

Downspout disconnection:

- Reduces instances of basement flooding
- Reduces sewage treatment expenditures
- Adds sewer capacity
- Reduces need for costly trunk sewer projects

Downspout Disconnection

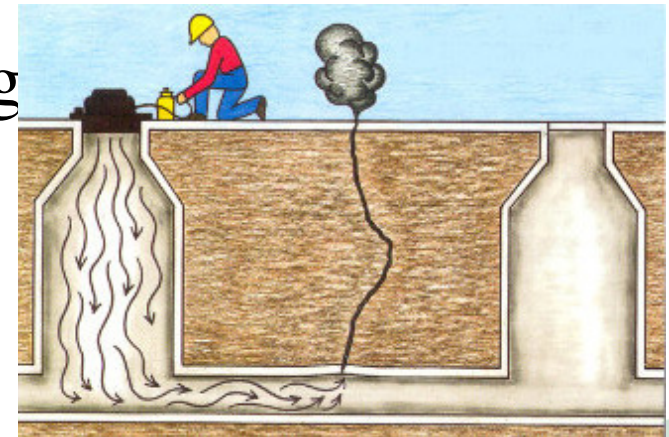
- Voluntary Program
- Began in March 2012
- 1,933 downspouts have been disconnected so far (1,128 in 2012, 805 in 2013).



- Additionally, there were 1,738 instances where disconnection could not be done because of drainage or safety issues.

Other Measures in the Short-Term:

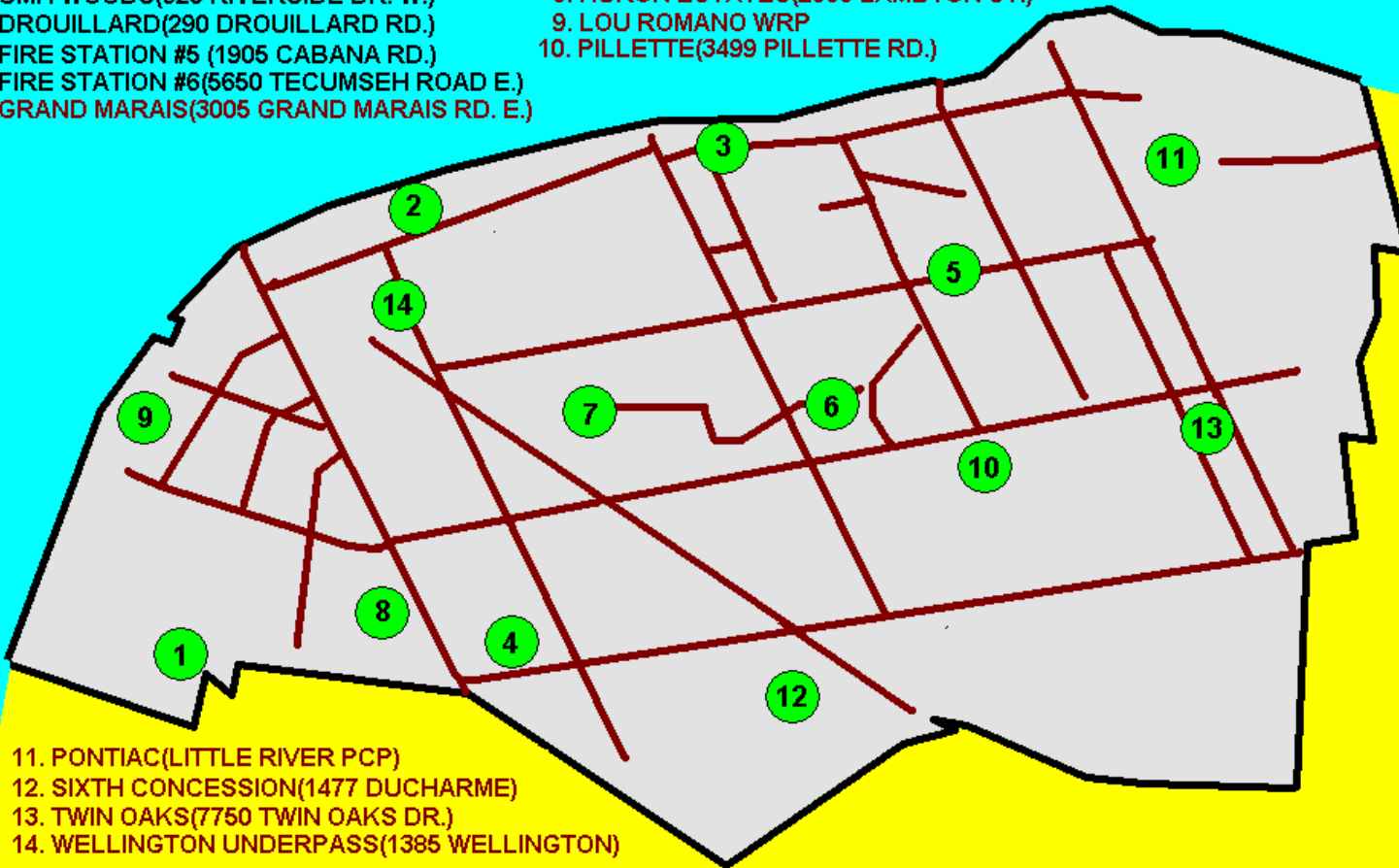
- Flow monitoring and hydraulic modelling of the City's sewer system
- CCTV inspection – 1% of capital allocated
- Purchased permanent flow monitoring equipment
- Targeted smoke and dye testing
- Development of a Master Plan



Installed more rain gauges for better data

1. AMBASSADOR(1021 SPRUCEWOOD)
2. CMH WOODS(620 RIVERSIDE DR. W.)
3. DROUILLARD(290 DROUILLARD RD.)
4. FIRE STATION #5 (1905 CABANA RD.)
5. FIRE STATION #6(5650 TECUMSEH ROAD E.)
6. GRAND MARAIS(3005 GRAND MARAIS RD. E.)

7. HOWARD GRADE SEPARATION(2479 HOWARD AVE.)
8. HURON ESTATES(2355 LAMBTON ST.)
9. LOU ROMANO WRP
10. PILLETTE(3499 PILLETTE RD.)

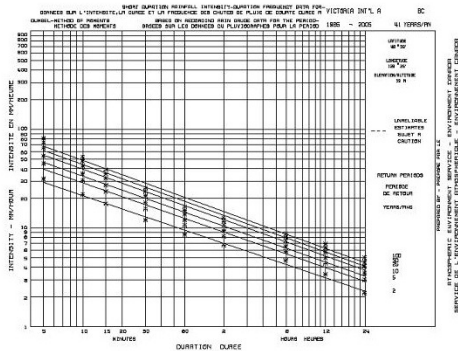


11. PONTIAC(LITTLE RIVER PCP)
12. SIXTH CONCESSION(1477 DUCHARME)
13. TWIN OAKS(7750 TWIN OAKS DR.)
14. WELLINGTON UNDERPASS(1385 WELLINGTON)

Other Measures: (cont.)

Participate in the Insurance Bureau of Canada's study with respect to residential basement flooding being conducted in several cities across Canada

Update the Rainfall Intensity Duration and Frequency (IDF) curves through the Essex Region Conservation Authority (ERCA) in partnership with interested local municipalities



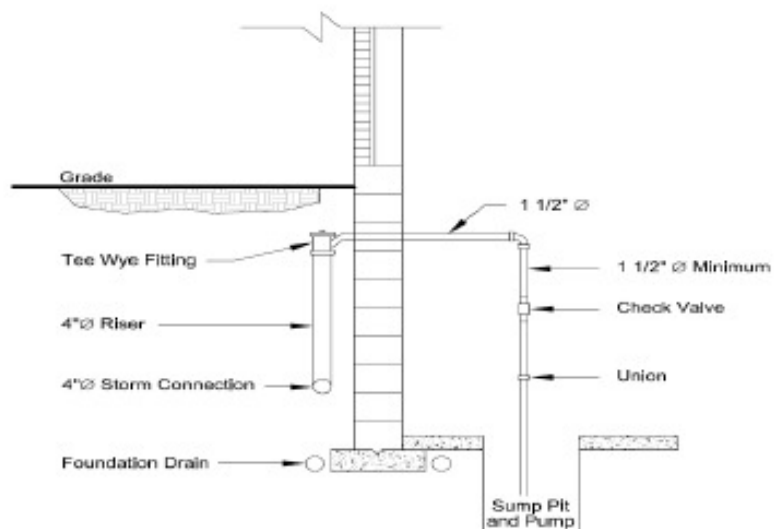
Other Measures: (cont.)

Upgraded the information on the City's website with respect to basement flooding and provided links to:

- The [How to Reduce the Risk of Basement Flooding](#) video provided by the Insurance Bureau of Canada;
- The Institute for Catastrophic Loss Reduction's (ICLR) [Handbook for Reducing Basement Flooding](#), authored by Dan Sandink; and
- [Conversion of Sump Pump to Discharge Outside House.](#)

Conversion of Sump Pump to Discharge Outside House

Existing Typical



SUMP PUMP TYPICAL DISCHARGE

NOT TO SCALE

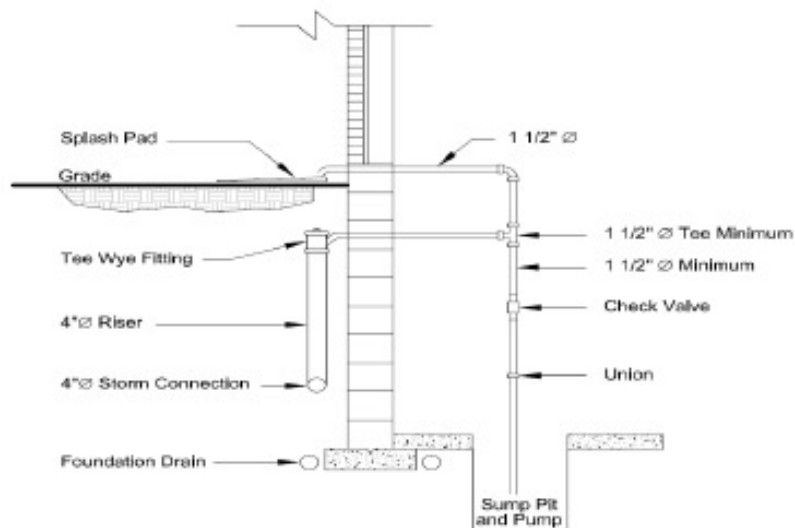
* NOTE : PIPE SIZES SHOWN ARE MINIMUMS

REVISED: SEPTEMBER 11, 2008
 DATE: SEPTEMBER 22, 2006
 PUBLIC WORKS - GEOMATICS

DRAWN BY: W. ROY

4M-081B

Conversion



SUMP PUMP OVERFLOW DISCHARGE PIPE
 TRANSITION FROM AN EXISTING SYSTEM

NOT TO SCALE

* NOTE : PIPE SIZES SHOWN ARE MINIMUMS

REVISED: SEPTEMBER 11, 2008
 DATE: SEPTEMBER 22, 2006
 PUBLIC WORKS - GEOMATICS

DRAWN BY: W. ROY

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- Also included informational videos on the City's You Tube channel:

[“Downspout disconnection program”](#)

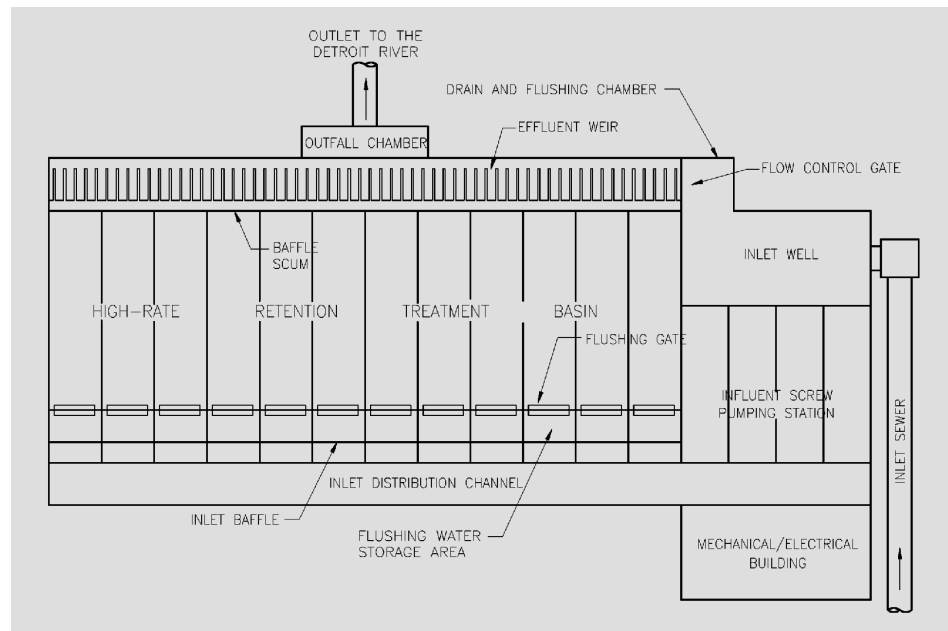
[“Wastewater: Where does it go?”](#)

[“Climate change adaptation plan”](#)

Large Project (\$\$\$\$)

Riverfront Treatment Basin (RTB)

- **\$67 million project** (entire capital budget is typically \$100m of which \$60m is spent on roads & sewers)



Riverfront Treatment Basin (while under construction)



Riverfront Treatment Basin once completed



Thank You

Questions?

