

**Showcasing Water Innovation
Elm Drive
March 2013 Monitoring Update**

Monitoring Progress

Water quantity (flow) monitoring started in July 2011. A weir and a continuous water flow logger were installed in the manhole downstream of the LID infrastructure and set to record water level at 10 minute intervals. The logger has been operating continuously since it was installed.

In May 2012 an automatic sampler was installed in the same manhole to collect water quality samples during storm events. To date, samples from 16 storm events have been collected.

Prior to November 2012, a City of Mississauga precipitation gauge located approximately 1 kilometer away from the Elm Drive site provided precipitation data for this project. In November 2012 CVC staff installed a new rain gauge and air temperature logger on the roof of the Elm Drive Adult Education Centre. They are set to record precipitation and air temperature at 10 minute intervals to match the flow logger time steps. Going forward, data from this new gauge will be used for the Elm Drive monitoring program.

Since August 2011, for rain events not involving snow melt of up to 14 mm, no outflows have been observed leaving the LID infrastructure. In other words, roughly 56% of all rain events are being filtered and cleaned before entering Lake Ontario. Between August 2011 and September 2012, 1.9 million litres of stormwater has been stored and infiltrated at the Elm Drive site, this amount of water can fill 1.3 Olympic sized swimming pools.

- **Landscaping** – Does not take place during the winter months.

Winter 2013 photos of the Elm Drive rain garden planters



The photo on the left shows a snow dump from plowing the parking lot

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March 2013 Monitoring Update**

- **Maintenance** – As the LID site is next to an adult education school, litter continues to be a significant maintenance issue. The improved landscaping and educational signage will help to bring attention to the issue of litter and the purpose of these practices. Also, CVC will engage the City in developing a maintenance strategy for the site. Weeding and litter removal were performed by CVC's Conservation Youth Corps in August 2012. As can be seen in the pictures, the plants have died back for the winter. Though out the winter snow was plowed from the parking lot into the bioretention cells.
- **Water Levels** - Initial results from the observation well level loggers have shown that the bioretention cells are operating properly. Monitoring of flows from the site has found that in 1 year, 1.9 million litres of stormwater (1.3 Olympic size pools) has been stored and infiltrated by the bioretention cells. For rain events up to 13 mm, no outflow has been observed from the LID infrastructure.

Flow was recorded on January 13, 2013 for a 36 mm event including snowmelt from a previous snowfall event (~5 cm). Flow was also recorded during a larger 47mm event on February 26. On March 11 flow was recorded from a much smaller 10mm event; however, this event also involved a large amount of snow melt.

The largest precipitation event recorded to date was during Hurricane Sandy at the end of October, with a total of 50 mm over several days (October 27 – November 1, 2012).

Table 1 - Recorded precipitation events in 2013 resulting in flow at Elm Drive compared to Lakeview control, grass swale and LID sites. "X" indicates that flow was recorded at that monitoring station during the applicable event.

Date	Total Rainfall	SWI				
		Elm	Lakeview			
			Control	Swale	LID South	LID North
11-Jan-13	6		X			
13-Jan-13	36*	X	X	X	X	X
26-Jan-13	4		X			
28-Jan-13	9		X	X		
30-Jan-13	21*	X	X	X	X	X
08-Feb-13	4					
09-Feb-13	6					
12-Feb-13	5		X	X		
14-Feb-13	0		X			

**Showcasing Water Innovation
Elm Drive
March 2013 Monitoring Update**

19-Feb-13	9		X	X		
26-Feb-13	47*	X	X	X	X	X
11-Mar-13	10*	X	X	X		
18-Mar-13	4		X			

*Snow melt in addition to rainfall occurred

Number of Sampling Events at each SWI Site

Table 2 - Number of precipitation events sampled per monitoring site and the number remaining in the SWI commitment.

	SWI					
	Elm	Lakeview			IMAX	Public Lands
		Control	Swale	LID		
Commitment						
Surface Water	20	20	20	20	20	0
Groundwater	0	0	0	0	4	0
Soil	0	0	0	0	1	1
Rain Tank	0	0	0	0	0	0
Taken to Date						
Surface Water	16	25	14	7	0	0
Groundwater	0	0	0	0	1	0
Soil	0	0	0	0	1	1
Rain Tank	0	0	0	0	0	0
Remaining						
Surface Water	-4	5	-6	-13	-20	
Groundwater					-3	
Soil					0	0

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March 2013 Monitoring Update

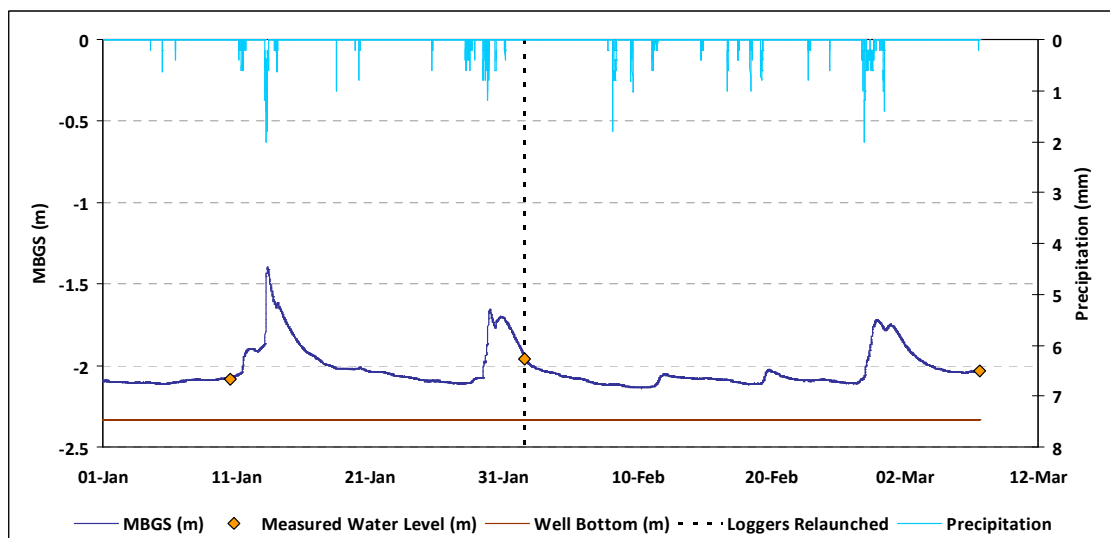


Figure 1 - Elm Drive Water Level and Precipitation at Observation Point 2 from January 2013 to early March.

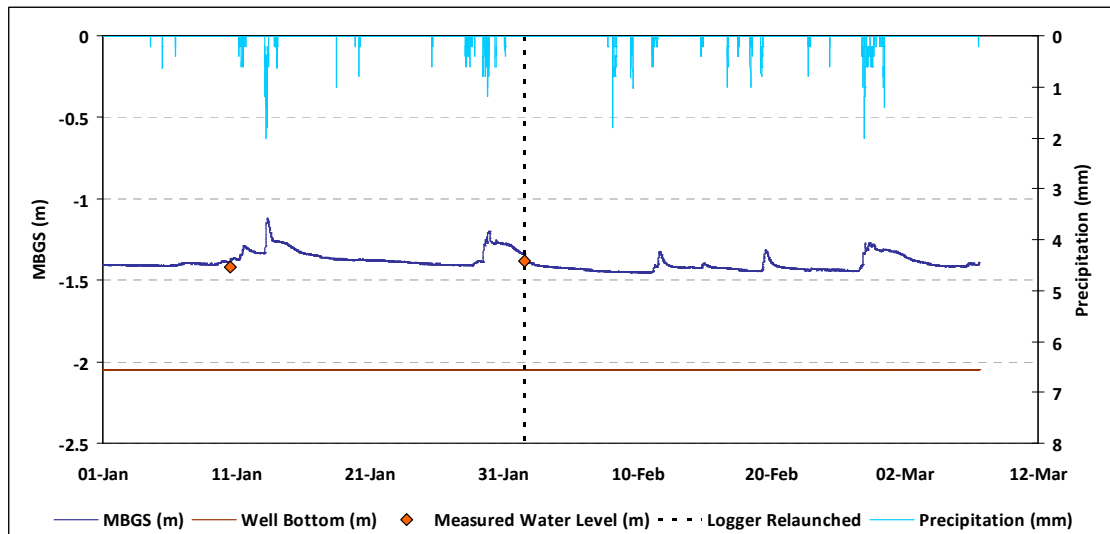


Figure 2 - Elm Drive Water Level and Precipitation at Observation Point 3 from January 2013 to early March.

Showcasing Water Innovation
Elm Drive
March 2013 Monitoring Update

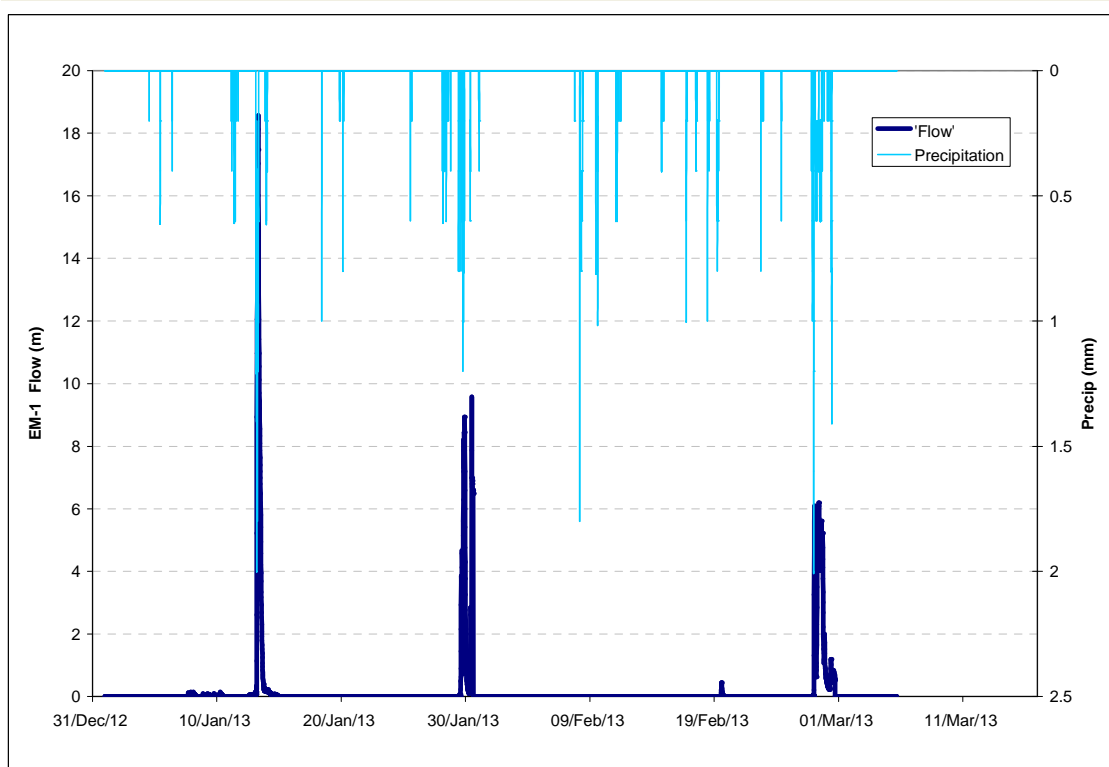


Figure 3 - Elm Drive Outlet Water Flow and Precipitation from January 2013 to early March.