

## **Inflow & Infiltration – Downspout Disconnection City of Thunder Bay, Ontario**

### Description

In 1999, a Downspout Disconnection Program (DDP) was initiated as part of the Wastewater Collection System Management portion of the City of Thunder Bay's Pollution Prevention Control Plan. The City had issues with basement flooding in older neighbourhoods, both residential and commercial, where downspout connections to the sanitary sewer were most prevalent.

The goals of the Downspout Disconnection Program were to accomplish the following:

- Further reduce sanitary sewer surcharging and basement flooding.
- Reduce loading at the City's Wastewater Treatment Plant during rainstorm events.
- Encourage and promote water conservation by utilizing the City's Rain Barrel program. This gave property owners an incentive to use their downspout water to conserve household water usage, while helping to alleviate surcharging of the sanitary sewer, basement flooding and overloading at the Water Pollution Control Plant.

A private not for profit organization called EcoSuperior Environmental Programs assisted the city with the roll out of the Downspout Disconnection Program through customer outreach. A Homeowner's Guide to Thunder Bay Downspout Disconnection Program (attached at the end of this document for reference) was distributed to city residents and businesses that required disconnecting.

The program cost was relatively inexpensive to the City, since the cost of the disconnection was on the individual property owners.

The DDP took over a year to implement. From identifying the problems areas in the city, to having the residents perform the disconnections.

## Background

In 1996, the City of Thunder Bay initiated a Pollution Prevention Control Plan to reduce the inflow and infiltration of rainwater into the sanitary sewer system. As part of the plan, the downspout disconnection was deemed to be a significant contributor to the surcharging of the sanitary sewer. Historically, the City would experience 70 -100 basement floods and a large increase in the influent flow at the Water Pollution Control Plant during extreme precipitation events.

The City of Thunder Bay did have Municipal Code #846.15 and a Sewer Use By-law which both prohibited the connection of downspouts to the sanitary sewer system, but had not been strictly enforced up to that point.

Before executing the Downspout Disconnection Program, target areas were first identified. Although it was known that downspout connections were prevalent in older areas of the city, jar ladders installed in manholes were used to identify and confirm surcharging in those areas. The DDP was prioritized based on greatest need where historical records showed basement flooding had occurred.

The City enlisted the help of a private not for profit organization, EcoSuperior Environmental Programs, to deliver information to the property owners identifying the need to remove their downspout connections from the sanitary sewer, as well as suggested methods of removal. At the same time, customer awareness of the Rain Barrel Program was raised, which entailed the selling of rain barrels to city water account holders at a discounted rate. Rain barrels were one of the possible options provided to customers when disconnecting their downspouts.

## Results

In total, 786 properties were identified by staff at EcoSuperior. Of those properties, 64% complied and disconnected their downspouts from the sanitary sewer. There are still properties which require attention, because they are not able to disconnect due to site constraints, or require the assistance of the City's Engineering Division on how to disconnect. These properties are being dealt with, as road/infrastructure upgrades occur.

The City estimates that there have been no basement flooding events due to sewer surcharging from 2000 to 2006 which translates into the following benefits:

- Estimated savings of \$17,000/ year which would have historically been paid out in overtime of City staff to deal with rainstorm events (based on 2 events per year).
- Estimated cost savings from reduced insurance claims is approximately \$60,000/yr
- Estimated savings of \$980,000 from reduction of inflow and infiltration from 2000 to 2006, considering the variable operation and maintenance cost of \$113.72 per ML treated (costs dependant on flow such as energy costs and, chemical costs)

## Contacts

Michelle Warywoda, P. Eng  
Process Engineer, Environment Division  
City of Thunder Bay  
(807) 625-2526  
[mwarywoda@thunderbay.ca](mailto:mwarywoda@thunderbay.ca)

Kerri Marshall, P. Eng  
Manager, Environment Division  
City of Thunder Bay  
(807) 625-2836  
[kmarshall@thunderbay.ca](mailto:kmarshall@thunderbay.ca)



## Thunder Bay Downspout Disconnection Program

Presently there are households and businesses that have their downspouts connected to the city's sanitary sewage system. This causes problems for both the residents and the city. Fortunately, there are several simple ways to redirect rainwater with many benefits for your yard and garden.

### Why do DOWNSPOUTS need to be disconnected from the Thunder Bay Sewage System?

- ❖ During rain storms the sewage system may back up which in turn floods basements.
- ❖ Overloading of the sewage treatment plant causes excess wear and tear, adding unnecessary cost to the city and to you the customer.
- ❖ During heavy rainstorms, untreated sewage may overflow into rivers and streams.
- ❖ If your downspout is connected, the sewage plant is treating clean water that does not require treatment.

### Why is Rainwater Beneficial?

- ❖ It is FREE!
- ❖ It is easily collected and stored.
- ❖ It is naturally soft and contains no chlorine.
- ❖ It is warm in temperature which is good for plants.
- ❖ It can be used to water flower and vegetable gardens, and even the grass.

## CAUTION

Be careful when you are redirecting rainwater:

- ❖ Direct water away from the house foundation.
- ❖ Do not direct rainwater in such a way that it might cause erosion.
- ❖ Do not direct water onto another persons property.
- ❖ Do not direct water in such a way that it might cause icing on sidewalks or driveways

### Where Can I Get The Necessary Materials For Disconnecting My Downspout?

- ❖ Local Hardware Stores
- ❖ Yard and Patio Stores
- ❖ Roofing and Siding Companies
- ❖ Local Contractor

### List of possible materials needed for disconnecting and redirecting downspouts:

- ❖ Downspout extension
- ❖ Splash pad
- ❖ Roll-out style downspout extension
- ❖ Pop-up drainage emitter
- ❖ Rain barrel
- ❖ Downspout angle joints
- ❖ Pipe straps
- ❖ Plastic or concrete plug (to plug sewer connection)
- ❖ Rain valve
- ❖ Screws for plastic or metal downspouts

## PLEASE NOTE

If you are not able to perform the downspout disconnection yourself, please contact a contractor for help.

## Homeowner's Guide



## Thunder Bay Downspout Disconnection Program

CITY OF  
**Thunder Bay**  
Superior by Nature



Suite 101-212 Miles St. E.  
Thunder Bay, ON P7C 1J6  
Tel: 807-624-2140  
Fax: 807-621-0005

- ◆ The following diagrams describe possible options when disconnecting your downspout. Choose the one that suits your property and budget.

