



DIRECTOR OF PUBLIC WORKS

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MEMO

TO: Board of Public Works and Water and Sewer Board

FROM: Tom Grisa

SUBJECT: Flooding

DATE: (unknown – auto formatting of date put in August 12, 2008, but property details show it was done August 4. –ed.)

Alderman Jerry Mellone sent out the attached email indicating options for addressing flooding in the City of Brookfield. Staff has previously identified some of these options in the memo to the Aldermen on July 11, 2008. This is an item for discussion at the August meetings. To aid in the discussion of Alderman Mellone's options, I have included his comments below and additional comments on each item (in bold).

1. Create a program that inspects and eliminates sump pump discharge into the sanitary system. This could be accomplished with a voluntary program with instructions to residents and businesses to verify compliance and have laws in place to fine those who do not comply with this program.

The City has conducted inspections for illegal sump pump connections in the past. After the flood of 1997 the City inspected the hot spot areas and found a dozen or so violators among thousands of homes. Illegal connections are not as prevalent a problem as one might think or had hoped (as it appears to be an “easy” solution to correct). Accordingly we are not sure how many violators staff would find. It is a significant expense and takes a lot of time to perform these inspections. In any regard, this is an option identified in the list of methods for improving stormwater drainage, reducing flooding and minimizing basement backups included in my memo to the Council dated July 11, 2008. Current City ordinance and state law already prohibit these connections.

We can certainly educate the public relative to what is legal and illegal and we should. However, those who are willfully violating the law are difficult to find and even more difficult to keep in compliance since the cost to change the connections is low and relatively easy to perform.

2. Have staff meet with WE Energies and arrive at solutions to avoid power outages. Loops in the design of their system could provide back ups to areas susceptible to power outages.

Looping electrical distribution systems is common practice and has been done for multiple decades by WE Energies for their own purposes of reliably serving their customer. Staff met with WE Energies after the 1997-1998 storms and convinced them to perform aggressive tree trimming and tree removal. Also we need to encourage residents to support these efforts as many have resisted and opposed WE Energies from trimming or removing trees that have a tendency to interfere with power lines. We continue to request WE Energies to update their systems and maintain the overhead lines. In some cases the City has paid to bury the power lines to protect the lines from damage during storms and for aesthetic reasons.

3. Encourage and offer incentives to new construction that utilize on site storage and use of rain water. Rainwater can be stored under parking areas and on site for use on site. Web sites such as www.rainwatermanagement.com and www.ads.com along with others show rain water storage techniques and uses of this water for irrigation, laundries, truck and car wash, flushing toilets etc. This practice will help the overloading of our sanitary system as well as augment our potable water supply. Brookfield should set an example by utilizing these techniques in the construction of its schools and facilities.

Underground storage of rain water has been constructed at a few commercial sites (Johnson Bank at North and Lilly and the new Schlossman's car dealership on Capitol and Brookfield). This serves as a substitute for an above ground detention pond and meets City standards for stormwater management. City staff supports this option and adherence to the City storm water ordinance as it affects flooding and drainage.

However, use of rain stored water for non-potable purposes will have an imperceptible impact on sanitary sewer flows during flood events since this constitutes a miniscule portion of the flow. So while this option may be considered environmentally friendly, it has little to no impact on sanitary sewers and basement backups.

4. For those homes still affected by sewer backup, Brookfield should help the residents isolate those problem homes and utilize back water valves to stop the sewer backup. In-line back water valves, due to design flaws, can add to the problem because the flapper tends to trap debris rendering these valves ineffective. There is an automatic operating back water valve manufactured by J. R. Smith Co. that utilizes the pressure created in the line to activate a stainless steel knife gate that stops the back flow when the sewer is in flood stage. This device automatically stops the back up and opens a full port line when the flood subsides. This device has proven effective for over 10 years and gives the home owners peace of mind that their home will no longer flood due to sewer back up.

Given this is a legislative referral, staff is unclear if Alderman Mellone is advocating that the City provide these valves for these property owners and if so who would pay for the valve and the installation, maintain it and what about liability if it failed? Or is this just to educate the public that these types of things are available? Staff certainly supports education on this issue to the public by many means.

Placing valves on some homes may shift the problem to neighboring properties that didn't get backups in the past since it does not address the excessive rain water infiltrating and flowing into the sewer system.

Finally, it should be noted that all valves require maintenance. Failure to provide such maintenance has resulted in some property owners in Brookfield who had valves still having backups because of poor or lack of maintenance on the valves. Property owners should understand this.

A better alternative is to install hung plumbing in the house and separate the basement floor drain and basement laundry tub (and basement sink, toilet and tub or shower if they exist) from the lateral and connect them to a grinder pump and sump system.

5. If storm water from a sump pump is the cause of a flooded basement due to power outages, there are battery operated sump pumps that can be installed to alleviate this problem. These require a well-maintained battery. If the home owner is not inclined to maintain this equipment, they could install a city water activated sump pump that works like an aspirator during a power failure. City water pressure creates a siphon on the sump pump discharge and automatically dumps the water to grade during a power failure. This is manufactured by Base Pump.

Given this is a legislative referral, staff is unclear if Alderman Mellone is advocating that the City supply these to property owners or is this just to educate the public? Again staff recommends educating the public regarding this and other ideas for improving drainage and reducing rain water into houses and the sanitary sewer system.

My experience in talking with property owners is some batteries lose power rather quickly which is dependent on the type of pump, type of battery, how often the pump runs, etc. and maintenance of the battery. A backup generator with an automatic transfer switch to natural gas is the best (and most expensive) option and will run virtually continuously.

Water actuated "pumps" use water to pump the siphon water from the sump crock. This system is intriguing but has some issues as well. This system adds more water to the storm sewer system or ditches during a major rain event. During such events we don't need more water in the system. Also, these systems need to be maintained as well since it poses a potential interconnection between the water supply and the sump system if the backwater valves fail on the device.

6. Brookfield could also purchase gasoline or diesel powered pumps. These pumps could be used to pump out problem areas during power failures and high event storms. The Dept. of Public Works should have a disaster plan in place before we have another event like we had in June.

The City has portable pumps already and uses them as part of our plan for addressing major flooding and basement backups. Because of the variability of the floods and rain events, the plans are flexible and staff responds to the worst hit areas first, adjusting pump operation and locations as the storm progresses and conditions change. Staff are also deployed to check and clear inlets and storm sewer grates throughout the City including drainage courses.