

A. SANITARY SEWER WET WEATHER EVALUATION PROJECT

1. Introduction

Since 2002, the City of Ann Arbor has been implementing a footing drain disconnection (FDD) program to reduce rainfall dependent inflow and infiltration (RDII) and the subsequent risk of sanitary basement backups from their wastewater collection system. The City is responsible for operating and maintaining the public sanitary and stormwater infrastructure. Following numerous complaints and questions about the FDD program, the City suspended a large portion of the program in 2012. Following this suspension, the City initiated a Sanitary Sewer Wet Weather Evaluation (SSWWE) project specifically intended to address the following objectives:

- a. Engage the public through the project, including the formation of a Citizens Advisory Committee (CAC) to make the final recommendations to Council.
- b. Evaluate the flow removal effectiveness of the FDD program.
- c. Evaluate the risks of future basement backup and sanitary sewer overflows from the sanitary sewer system.
- d. Develop recommendations for the wet weather program for the City's sanitary sewer system.

In response to the FDD Survey performed, an additional objective was identified during the course of the study which was to examine issues with the FDD program to date and make recommendations to correct the issues. This is a new objective identified during the project and is covered in Section B.

The technical study consisted of sanitary flow metering, quantification of the flows removed from the sanitary system from the FDD program, hydrologic modeling to understand the frequency of sanitary wet weather peak flows, hydraulic modeling to support a sanitary capacity assessment, and the development of action plans to address identified sanitary sewer system deficiencies. Public engagement was performed throughout the project, including public meetings and the development of the CAC. The 2013 sanitary flow metering period experienced a number of significant rain events and provided suitable data to perform the study.

2. Major Findings

The most significant outcome from the study is the recommendation that additional **FDDs are no longer needed** in the original five (5) target areas. Other major findings from the study include:

- a. The FDD program on average removed about 65% of the wet weather peak flow in the target districts from the sanitary system. Four (4) of the five (5) target districts (Orchard Hills, Bromley, Morehead and Dartmoor) have a 90% or greater statistical confidence of significant flow removals. A map of the five (5) target districts can be found in the Volume 2: Flow Evaluation Report, page 5, Figure 1. The Glen Leven district appears to be less effective,

with a flow removal rate of about 36%, and the reason for this is still unknown.

- b. The FDD program reduced the risk of basement backups in the target districts to the point where additional FDDs are not needed in these districts to achieve the desired level of protection for the system. For example, prior to the FDD program, a large storm event would result in widespread sanitary basement backups, especially in the target areas. After FDD, during the large storm event that occurred on June 27, 2013, there were no reports of basement backups attributed to the sanitary sewer system, in the five (5) target areas. Several high-risk homes in these areas had check valves installed prior to the study. However, the sanitary flow metering data shows that the sanitary sewer depths did not fill the pipes in these areas, so it is unlikely that the check valves were active and needed during this storm.
- c. The hydraulic capacity assessment of the sanitary sewer system shows no issues in the target neighborhoods, except a section of pipe approximately 1,800 feet long in the Glen Leven district with a potential hydraulic restriction.
- d. Five (5) potential hydraulic deficiencies (NOT the same as the five (5) original target areas) and one (1) potential operational improvement were identified in the downstream sanitary collector interceptors. These project areas are significantly less than what the City staff was expecting based on past studies. An action plan was prepared for each area. The Technical Oversight Advisory Committee (TOAG) reviewed these technical findings at their meeting on September 18 and concurred with the findings.
- e. The Wastewater Treatment Plant (WWTP) has adequate capacity to handle existing and future peak flows, and with the completion of the plant overhaul project, will be upgraded to continue to provide this level of performance for the long-term.
- f. A December 2013 survey of homeowners who had FDD performed in their home was conducted which led to follow-up inspections and a plan to alleviate issues with FDDs that were found to be out of compliance with the FDD project specifications. Findings and recommendations are in Section B.

3. Basis of System Evaluation

The design scenario that was selected for the evaluation of the sanitary system is described below:

- a. Future growth in City based on planned development.
- b. Future growth in township contract customers based on setting sanitary flows to contract limits.
- c. 25-year recurrence interval peak sanitary flows plus 10% additional peak flow for:

- i. Climate change (EPA National Stormwater Calculator “6-35 year high-wet” scenario is 10.4% increase in peak flows), or
- ii. Increase in level of service from 25-year to 50-year (which is a 9% increase in peak flows), or
- iii. Additional growth beyond that contained in the planned development.

Note that a larger scenario was also examined, which increased peak sanitary flows by 20% over the 25-year recurrence interval peak flow used in the design scenario described above. In OHM’s evaluation of this larger scenario, the extent of the surcharging did not increase significantly. The increase in sanitary flow from the larger scenario could be addressed during project design through a small incremental upsizing of a system upgrade, such as building a slightly larger relief sanitary sewer, for example. This could potentially provide a large increase in the level of service provided by the sanitary sewer for a marginal increase in cost, and should be evaluated before sanitary upgrades are finalized.

4. Action Plans for the Six Project Areas

Five (5) potential hydraulic deficiencies and one (1) potential operational improvement were identified in the downstream sanitary collector interceptors. These can be found on a map shown in the Volume 4: Hydraulic Report, Appendix A. Many of the issues identified will require collecting and analyzing additional information from the specific location to further understand what improvements are required. An action plan was prepared for each area. The six (6) Action Plans are attached and are as follows:

- a. Huron / West Park
- b. High Level / 1st Street
- c. High Level / State & Hoover
- d. Pittsfield Valley
- e. Glen Leven
- f. Glen/Fuller Diversion (operational improvement item)

5. CAC Recommendations

During the October CAC meeting, in an attempt to identify where consensus existed regarding the recommendations, the facilitator polled the attending CAC members. All CAC attendees, ten (10), supported the recommendations below:

- a. Perform the tasks outlined on the six (6) action plans for the project areas.
- b. Should sanitary sewer system upgrades be required to address an issue in the six (6) project areas, utilize the larger design basis (50-year rain) as described in the Volume 4: Hydraulic Report, if doing so results in a marginal increase in the project cost and disturbance to the public.

- c. Install a series of permanent meters in critical sanitary sewer system areas to provide a long-term record of sanitary system performance.
- d. Formalize and perform a rotating maintenance program to proactively find high sanitary flows, blockages and collapses in the sanitary sewer system, including quickly establishing a baseline for the entire City. This would include rotating temporary sanitary sewer metering, sanitary manhole inspections and sanitary pipe video inspections. The frequency of the rotating program should follow industry standards for asset management and be planned to provide proactive identification of sanitary sewer issues. A higher frequency should be focused in those portions of the sanitary sewer system experiencing greater issues, such as those in the problem areas already identified. The program should include periodic evaluation of the original five (5) target FDD districts to verify they are still performing as desired.

B. FDD SURVEY / ISSUES RESOLUTION

1. FDD Survey Results - Dec 2013 to Jan 2014

- a. 2350 surveys mailed to participants of both the City FDD program and the Developer Offset Mitigation (DOM) program, 850 responses – 133 completed online; 717 returned by mail, 36% response rate (Note: typical response rate for a municipal survey ranges from 20% to 40%).
- b. Confidence level that the sample results represent responses from the entire set = 99%, with margin of error = 3.6% +/-.
- c. 70% satisfied with sump pump installation.
- d. 45% would recommend sump pump installation to a neighbor, twice as many as those who would not.
- e. 100 of the 134 respondents that reported experiencing sanitary sewage backups PRIOR to FDD/sump pump installation did NOT experience them after FDD/sump pump installation.
- f. 106 respondents who reported no flooding/seepage/dampness BEFORE FDD said they did experience flooding/seepage/dampness AFTER FDD.
- g. Almost 40% reported some or significant increase in anxiety.
- h. Received 131 comments of dissatisfaction; 71 comments of satisfaction.

2. FDD Survey Follow-Up Results

- a. Objective: Collect information on prioritized list of survey respondents to document their problems, identify common issues, and develop improvement recommendations.
- b. 150 homes identified, 101 homeowners contacted, 52 site visits performed, 25 phone interviews performed (all by OHM).
- c. 77 homeowner reports completed, 10 homes identified where the FDD installations not according to specification appeared to cause water issues. At this rate of incidence, about 2% of 1,800 City FDD Program sites may not have been installed according to specification or somewhat less than 50 homes.
- d. FDD Mitigation Subcommittee comprised of SSWWE and FDD CAC members formed to review OHM results and make go forward recommendations.
- e. The subcommittee met three times during July and August. A set of recommendations emerged from the process. The sources of the recommendations were the City Staff, OHM, and the subcommittee.
- f. This set of recommendations was reviewed extensively at the September 10, October 8 and November 12 SSWWE CAC meetings. During these reviews,

the set of recommendations changed, as CAC suggestions were considered. In addition, the project team contributed changes to this set.

- g. During the October CAC meeting, in an attempt to identify where consensus existed regarding the recommendations, the facilitator polled the attending CAC members. This polling was updated at the November CAC meeting. Many of the recommendations achieved consensus support from the CAC participants. Some of the polling tallies do not add up to the twelve CAC members on the committee due to absences or CAC members who abstained from voting on certain items. The results of the polling process for the recommendations that received consensus support are below. See Section III-E of this report for more detail on the polling results.

3. CAC Recommendations

- a. FDD as a program tool (for City projects). **The SSWWE project team recommended the discontinuation of mandatory FDDs in the target areas** because the FDD program to date has significantly reduced the risk of basement backups in those areas and additional FDDs are not needed. The use of FDDs as a program tool for the City on future projects going forward was evaluated by the CAC with the following results:
 - i. Do not retain the FDD program as is. (CAC polling results: All CAC members who voted, ten (10), supported this recommendation).
 - ii. Eliminate mandatory FDDs as a program tool option. (CAC polling results: Seven (7) CAC members support/ four (4) CAC members did not support).
 - iii. Modify the FDD program to be voluntary, incentivized and robust, with program changes that align with Best Practices (found on page B-92 of the FDD Survey Follow-Up Investigation Report found in section V-B of this report), and that gather input from candidate neighborhoods. (CAC polling results: ten (10) CAC members support/ one (1) CAC member did not support).
- b. Correct out-of-specification installations and conduct sump pump Outreach Program. Polling results: All CAC members, twelve (12), supported this recommendation.

The City will initiate a program to correct FDD installations that were not completed according to specification or industry best practices, and were primarily responsible for water entering a basement. The City will retain a contractor to accomplish this program. Key elements of the program include:

- i. The correction process will start with the set of non-spec residences identified by the OHM investigation, ten (10), and will include any that emerge from the additional residences that OHM has not yet investigated (estimated to be somewhat less than 50 homes). The process will be done on a case-by-case basis.

- ii. The City will send a mailing to all properties that have participated in the City FDD Program, which will provide them with the opportunity to come forward with potential FDD related problems to be investigated and corrected if warranted. A deadline will be given to ensure that this process does not continue indefinitely.
 - iii. Develop an outreach/education program, including how-to videos, to all Ann Arbor sump pump owners, to provide homeowners more complete information about their sump pump system.
 - iv. The City will attempt to fund this program by making responsible contractors and consultants pay for the applicable portion of program costs.
- c. Implement OHM Best Practices. (CAC polling results: All CAC attendees, twelve (12), supported this recommendation). OHM outlined some of the best practices that it has observed from FDD programs over the years. Three categories of Best Practices were detailed:
- i. Customer Service
 - ii. New Installations
 - iii. Retroactive Work

Specific recommendations for each of the three categories are described in Section V-B of this report.

- d. Provide backup systems. (CAC polling results: Eight (8) CAC members support/ four (4) CAC members did not support.)

The recommendation is to provide a backup system to any resident desiring one who participated in the City's FDD Program. The estimated cost of providing the back-up systems to City FDD Program homeowners who do not currently have one is \$810,000.

CAC members also suggested that residents who participated in the City's FDD Program receive discounts on back-up systems, that a back-up system be included in a revision to the City's FDD Installation Specification, and that the City benchmark other city FDD program regarding back-up systems.

The rationale for the CAC members in support of the back-up recommendation is as follows:

- i. 1,800+ Homeowners were included in the City FDD Program, and the City did not fund backup systems despite the 2001 study recommendation to do so.
- ii. Although many homeowners welcomed the FDD program, many other homeowners felt that they were forced into the FDD program due to the \$100/month mandated increase in their sewer bill if they refused to have an FDD.
- iii. The FDD program was originally announced/intended as a city-wide program, not a select neighborhood program.

- iv. According to the 2013 Survey, 52% of the respondents expressed concern about a lack of a backup system.
 - v. Some DOM participants have been provided backup systems free of charge.
 - vi. Many target area residents were part of the City program for which a backup system was not offered; therefore, getting a backup system by participating in DOM was not an option for them.
 - vii. The FDD program replaced gravity systems with sump pumps. Sump pumps are not as reliable as gravity, which never wears out and continues to work during power outages. The backup systems will give the FDD participants a system that is more reliable (though not as good as what they had).
 - viii. Other municipalities in Michigan provide assistance in obtaining backup systems to FDD Program residents.
- e. Pay damage claims to homeowners who experienced water damages due to out of specification installations. (CAC polling results: All CAC members who voted, eleven (11), supported this recommendation).

The recommendation is to pay damage claims residents who incurred water damages primarily due to out-of-specification FDD installations and the responsible contractors and/or consultants should pay the costs for these claims. The estimated cost for paying these damage claims (based on the rate of damage in the eleven (11) out-of-specification homes currently identified) is \$160,000. The CAC's rationale for this recommendation is as follows:

- i. 1,800+ Homeowners were included in the City FDD Program.
 - ii. Although many homeowners welcomed the FDD program, many other homeowners felt that they were forced into the FDD program due to the \$100/month mandated increase in their sewer bill if they refused to have an FDD.
 - iii. The FDD program was originally announced/intended as a city-wide program, not a select neighborhood program.
 - iv. The OHM investigation revealed that perhaps 2% of FDD systems were not installed according to specifications and caused water damages.
 - v. Failing to pay for damage claims due to out-of-specification installation is not equitable, and not treating the FDD recipients in an equitable way will set a negative precedent for future programs that require broad public participation.
- f. Pay Homeowner Compensation. (CAC polling results: Three (3) CAC members in support; nine (9) CAC members not in support).

This recommendation involved paying non-damage related costs that FDD homeowners have incurred as a result of FDD installation. Typical cost items include sump pump replacement, back-up battery replacement and

sump pump insurance. As this recommendation was rejected by a majority of the CAC, it is not detailed in this summary. See Section V-C of this report for a more thorough description.

- g. Provide Financial Support for Senior Citizens and Economically Disadvantaged Ann Arbor Residents with FDD Issues. (CAC polling results: Eight (8) CAC members in support; three (3) CAC members not in support).

This recommendation is for the City to explore offering financial assistance to senior citizens and/or economically disadvantaged citizens who are having difficulties paying sump pump related expenses. The model for this program can be found in various Michigan utilities that help seniors and/or economically disadvantaged citizens with their electric/gas/water bills. These programs typically involve means testing.

- h. Provide free radon inspection for all City program FDD residences. (CAC polling results: Three (3) CAC members in support; Seven (7) CAC members not in support).

This basis of this recommendation is that the process of cutting a hole in the floor slab for has the potential to increase the seepage or radon gas into the basement. To address this risk, radon testing should be provided at all homes where FDD was performed to measure the radon levels. The CAC discussed the fact that radon is a general risk for homes in Washtenaw County, and that radon gas can enter from cracks and other openings in the basement besides the sump hole. The City's standard FDD installation specifications include sealing the sump hole so that gasses cannot escape.

- i. Examine modifying rates for properties without footing drains connected to the sanitary system in a future rate study. (CAC polling results: Ten (10) CAC members in support; one (1) CAC member not in support).

This recommendation involves studying whether or not properties that do not have footing drains connected to the sanitary sewer (and therefore do not drain footing water directly into the sanitary sewer system) receive a different level of service from the City. If the study validates that properties receive a different level of service, the methodology for allocating costs could be altered to reflect the differing level of service. Presumably, properties that do not have footing drains connected to the sanitary sewer receive less service from the City because the City does not treat footing drain water that comes directly from these properties.

In addition to studying differing levels of service, the CAC suggests that the study address whether or not it is feasible to give a water consumption or credit when a water backup pump activates due to a power shortage.

- j. Developer Offset Mitigation (DOM) Program recommendations. (CAC polling results: All CAC members who voted, eleven (11) supported these recommendations).

- i. Continue a DOM program with revisions.

- ii. Revisions to the DOM program allowing mitigation City-wide except for the developments where flows pass thru one of the five identified SSWWEP project areas.
- iii. Re-examining the design flow rates (table A).
- iv. Eliminate the 20% recovery factor.
- v. Revisions to the DOM program to evaluate the ability of allowing developers to make a payment in lieu of offset mitigation.
- vi. Revisions to the DOM program eliminating the 24-month requirement for using mitigation credits.
- vii. Periodically revisit the program and identify other high-risk areas as they appear.

C. ADDITIONAL ITEMS

A number of comments and issues have surfaced during the course of the project as noted below. This information was prepared by the SSWWE project team to fully document all items that were raised, and summarize how they were addressed.

1. Innovative Option - The University of Michigan has received a grant to examine smart sanitary sewer network of distributed sensors connected to real-time control with algorithms to operate control points to store flow where the pipes are not full, and the City of Ann Arbor is one of the participating cities for the research. This is a potential innovative option that could provide further protection for rare events, particularly those with significant spatial variation in the rainfall.
2. WWTP Capacity - No recommendations are made for capacity improvements at the WWTP. The study found that the WWTP has adequate capacity to handle existing and future peak flows, even for the largest flows evaluated under Scenario C (50-year wet weather flow, with future growth plus climate change). The study found that during Scenario C, the City's wet weather equalization tank at the WWTP would not overtop. There is the possibility that a storm event larger than Scenario C could occur, or that the equalization basin would not be completely emptied from a previous large storm event before another large storm event occurs. The expected occurrence of events that exceed Scenario C, or of two back-to-back storms large enough to send flow to the wet weather equalization basin is very rare, and is not considered a significant risk.
3. Manhole Inflow – A suggestion was made that sealing pick holes on sanitary sewer manhole covers might address the remaining issues in the sanitary sewer system. Pick holes can result in stormwater inflow into the sanitary sewer system and should be addressed where relevant. This recommendation is included in the action plans. The City is also addressing this flow source as an operational practice. The City has a program to plug manhole pick-holes and is currently implementing a program to seal manholes with a gasket cover in low-lying areas that are prone to flooding to reduce inflow through manhole covers. The SSWWE project team does not expect that sealing manholes and pick holes will fully address the remaining issues in the sanitary sewer system.
4. Water Conservation Measures - A suggestion was made during the project to consider drinking water conservation measures through retrofitting houses and businesses with low-flow fixtures and appliances as a mechanism to address peak sanitary wet weather flow issues. Water conservation measures are appropriate for consideration for other important purposes, but they are not considered practical to address peak wet weather flows in the sanitary sewer. This is due to the magnitude of the wet weather flow in the sanitary system, which are much larger than the base sewage flow generated from water consumption. For example, the base flow in the sanitary sewer system from water consumption is approximately 18 cfs. The peak wet weather flow in the sanitary sewer system during large rains ranges from 90 to 120 cfs depending on the scenario. Even if water conservation measures reduced water consumption by 50% or 9 cfs, which would be very aggressive, the peak wet

weather flows would only decrease by 7-10% depending on the scenario. Compare this to 70-90% flow reductions from the FDD program that were needed to significantly reduce the risk of sanitary basement backup in the priority districts. Based on these flow components, we do not believe that water conservation measures is an effective mechanism to address peak wet weather flows in the sanitary sewer system. This conclusion was presented to the chair of the Technical Oversight and Advisor Group (TOAG), and he concurred. Other methods of addressing sanitary sewer issues will be more practical and cost effective, as outlined on the six (6) action plans.

5. Burial Depth of Curb Drain and Sump Pump Discharge Lines – During the course of the project, a concern was raised regarding the burial depth of curb drain and sump pump discharge lines above the frost line. Sometimes, due to the shallow depth of the receiving storm sewer inlet, it is not possible to bury the curb drains and sump leads below the frost line.

Shallow storm sewer pipes buried above the frost line sometimes occur due to limitations with grading and slope available from the receiving surface waters. This is an inherent challenge with storm sewer pipes in general, and is not unique to the City of Ann Arbor. The common industry design basis for shallow storm pipes is to ensure that they are constructed with a positive slope and therefore will not have standing water within them, which minimizes the risk of freezing in winter. It is not uncommon for local drainage components, including storm sewers, to be built above the frost line, and these facilities do not typically have issues with freezing related blockages.

We examined the temperatures of the water discharged through the sump discharge lines and curb drains. We found that there is limited data available on the temperature of sump pump discharge water. However, the EPA has published a map of shallow groundwater temperatures¹ that shows groundwater temperatures in the range of 47 to 52 degrees Fahrenheit in Southeast Michigan. We are also aware of a direct measurement of footing drain water temperatures that was performed in Ypsilanti, Michigan, which indicated that the water remained relatively constant throughout the seasons at 54 to 55 degrees Fahrenheit.

The temperature of footing drain water is moderated by the ground, which provides a constant source of heat for groundwater, and reduces the variability of the groundwater temperatures, even in winter. The risk of winter freezing of curb drains and sump pump discharge lines is further reduced by the fact that they convey this relatively warm groundwater which would require additional cooling before freezing.

The City's burial depth standards for curb drains and sump pump discharge lines are based on the following requirements and assumptions:

- i. The sump discharge lines in the ROW and on private property are required to be constructed with a positive slope, meeting the project specifications and the building code based on the size of the pipe (24-inch minimum cover for 2-

¹ http://www.epa.gov/athens/learn2model/part-two/onsite/ex/jne_henrys_map.html

inch pipes²). Each construction installation has been verified and approved by Planning & Development Services.

- ii. With the required slope, the pipes will not have standing water in them.
- iii. It is also assumed that the sump pump discharge water is relatively “warm” and will not have time to cool down and freeze in the sump lead or curb drain if positive slope is present.

These requirements and resulting conditions promote effective functioning of the sump discharge line and curb drain, even under extreme cold conditions like those experienced last winter. The specifications themselves are not indicative of any systematic defect in the City’s system.

6. Use of Drilling Fluid in Curb Drain Installations - During the course of the project, a concern was raised regarding the use of bentonite drilling fluid in the installation of curb drains in the City’s FDD Program and whether the material is toxic. Bentonite is a clay material that is mixed with water to form a slurry to assist in the installation of directionally drilled pipes. The material is required to be inert by the City’s specifications, and is not toxic. The same material is widely used in the construction industry in the drilling of drinking water wells.
7. Gravity Back-Up for Sump Pumps – A suggestion was made during the project to examine the potential of a gravity back-up system for sump pumps, whereby if a sump pump failed, the footing water would be allowed to discharge to the sanitary sewer system by gravity before it backed up into the basement. The proposal included a check valve for back flow prevention and an automatic gravity overflow below the finished floor if the sump pump fails. The City’s building department reviewed this option and found that it would not meet State building codes and the City’s sewer ordinance. The SSWWE project team is not aware of any municipalities that have implemented such a gravity backup system.

Some municipalities have adopted the practice of placing a floor drain near the sump pump to provide an outlet over the floor to a drain in the case of pump failure. The City’s building department response to a question on this topic indicated that there is no minimum installation distance between a floor drain and the sump crock, however, the floor drain cannot be set up to act as a sump pit overflow drain, because sanitary and storm drainage systems of a structure shall be entirely separate (as a practical matter, if there is a significant overflow from the sump crock, it would drain via any existing floor drains). Also, it has been noted that the basement perimeter location typical for the sump crock is not typically the low point for the basement. Therefore, installing a floor drain adjacent to the crock may not effectively limit water from reaching other basement areas. Nonetheless, the CAC discussed that such an installation is a valid consideration for a homeowner contemplating the installation of a sump pump system, and as such requested that the City seek clarification from the State regarding whether such a system would meet State building codes.

²http://www.a2gov.org/departments/engineering/Documents/project%20management%20fdd%20guidelines_2005-11-30.pdf

8. Air gaps - During the course of the project, a concern was raised regarding the purpose and function of the air gaps on the sump pump discharge lines. An informational sheet was prepared on the air gaps, and is included on page 46, section 1.129 of the Q&A Log.

D. CAC COMMENTS ON EXECUTIVE SUMMARY

This is a section where CAC comments on the executive summary will be included. We would like to include a citation for whose comment it is, and tabulate other CAC members who support each comment.

1. A question was raised about the potential impacts of stormwater surface flooding on the flows in the sanitary sewer system from footing drains (Jim Osborn). The City addressed this question in the Q&A log and posted the answer to Basecamp on August 29, 2014. That answer can be found in Section 6c of the report.
2. CAC member Peter Houk issued a statement explaining why fair treatment for FDD participants is important and invited other CAC members to join in on his statement. Here is Peter's statement:

Through the FDD program, the city has substantially reduced the risk of basement backups in the target areas. The costs of the FDD program, however, were not equally distributed among sewer customers. Many FDD participants were not at risk themselves for basement backups, but their participation was nonetheless critical to the success of the program. FDD participants paid for the program through their sewer rates, as all sewer users did, but they are also paying for other ongoing costs: the loss of floor space in their basements, operation and maintenance, and extra insurance. Also, some residents who were the recipients of sub-standard FDD installations have had to pay to repair their homes after they were damaged by water and mold.

The CAC has generated several options for ameliorating the cost and inconvenience that FDD recipients have incurred as a result of their participation in the program. These ideas are intended to ensure that residents who participated in the FDD program when it was mandatory and intended for city-wide implementation are treated fairly. CAC members are not necessarily experts in municipal law nor municipal administration nor sewer engineering, so some of the ideas that have been put forth may not be feasible. Even if the CAC's proposals cannot be executed, the effort that went into formulating them should be taken as evidence that CAC members expect the city to do more to ensure fair and equitable treatment of all FDD participants. This sentiment is also reflected in the CAC poll: 8 CAC members voted in favor of backup pumps for FDD participants and 10 CAC members voted in favor of paying for damage caused by out-of-spec installations.

Fair treatment for FDD participants is important to CAC members for the following reasons:

- *Their participation fixed the basement backup problem.*
- *Because of their participation, additional residents in the target areas and throughout the city will not need to have FDD done to their homes.*
- *Because of their participation, the city avoided a sewer system upgrade that would have cost millions and would have destroyed open space and natural areas in the city.*
- *The city needs to demonstrate that those who participate in efforts to improve the community will be treated fairly. After all, this is not the last time the city will need resident participation to fix a big problem.*

To achieve fairness and equity for FDD participants, we as CAC members propose these actions and urge council and staff to find ways to implement them:

- **Backup pumps.** Many FDD participants were not at risk for basement backups, but in order to solve the basement backup problem they had to forfeit their very reliable gravity-based systems and replace them with sump pump systems that don't work during power outages and are susceptible to mechanical failures. Adding a backup to the sump pump will give FDD participants a system that is more reliable. While a sump pump with a backup pump will never be as simple or as reliable as the gravity-based systems these homes were built with, it will be much better than the system that the FDD program originally provided. Furthermore, other municipalities in Michigan included some support for backup systems in their own FDD programs.
- **Pay damage claims for sub-standard FDD installations.** City staff have proposed fixing sub-standard FDD installations, and this is a good start. But the damage that these installations caused needs to be fixed too. Even if the city doesn't have a legal responsibility to fix this damage, it needs to demonstrate that it will stand behind the residents who allowed their houses to be modified so as to fix the basement backup problem. The city needs to pay damage claims for problems caused by sub-standard FDD installations.

Member Judy Hanway had an additional comment:

My first thought on hearing about the FDD Program was, "how can this be legal?" The FDDP program, the DOM, and other aspects of the program are currently under the scrutiny of a pending lawsuit and other lawsuits are likely to follow. The legality of the initial FDD Ordinance is in question and this will need to be settled in the courts. Any and all recommendations in the SSWWE final report regarding FDDs and the DOM program must be evaluated against the final resolution of the pending lawsuit(s).

No more mandatory FDDs!

Common sense says that water pipes above the frost line (42" in Michigan) will probably freeze. A thorough investigation (by an independent group of professionals) of the frozen pipe depths, especially in low-flow conditions, should be undertaken. The current specifications developed by CDM for the curb lines do not appear to comply with common sense building and engineering practices and codes.

Something needs to be done to prevent these lines from freezing!

Having the air gap next to the foundation wall is a bad idea. If and when water pours out of there, it could (and has) damaged the foundation wall and reentered the house through cracks in the foundation.

*There should be pre- and post- radon testing if any more voluntary FDDs are to be done. A sump pump is a known entry point for radon. I think radon mitigation should be funded at all FDD/DOM locations. **At the very least**, all FDD homeowners should be informed that they should have their radon levels checked. The current FDD website implies that there is nothing to worry about regarding radon from the sump.*

*The FDDP saved the city of Ann Arbor a lot of money – **because it passed many costs, as well as the responsibility of upkeep, onto the individual homeowner.** Homeowners who agreed to disconnect, did the city a big favor. They should be compensated for the expenses they've incurred.*

Backup systems should be provided to those homeowners who want one. There are newer systems available now that are better than the 8 hour battery backup.

*The City Staff should pursue **seeking a variance to the state plumbing code** in order to allow overflow of sump water to drain (via gravity) to the floor drain. This would help to alleviate basement flooding during power outages.*

Homeowners who have had problems since disconnecting their footing drains should be compensated (this includes making appropriate repairs and paying damages).

We should dispose of the “pre-qualified” contractor requirement for the FDDP. If someone volunteers to disconnect, they should be able to hire any licensed plumber to do the work.

The DOM program should allow developers to fund infrastructure improvements as part of their mitigation requirements.

The City needs to address storm and surface water to prevent this source of water from reaching the footing drains. The storm water budget needs to be enlarged so that more of the problem areas can be fixed.

The SSWWE CAC has been assured that there is adequate capacity at the Waste Water Treatment Plant. However, I remain unconvinced. I see all the high-density buildings going up (dorms, apartments etc), and can't help but wonder how accurate the projections are.

We need to stop paying for multiple studies and consultants and start using our funds to fix the infrastructure!

The city of Ann Arbor needs to do what is necessary to stop future sewage backups (including a more aggressive rotating maintenance program, permanent metering, video inspection of pipes, repair leaking sanitary sewer pipes, and install gasketed manhole covers, especially in low-lying or Target areas).

Member Joe Conen also had an additional comment:

Please note me as concurring with Peter's statement.

A back up pump should be provided and installed for any FDD participant who would want one.

As a community we should treat the FDD participants with respect and fairness. This includes compensation for damage that resulted from to inadequate sump/ pump installation.

Other members who concurred with Peter's statement include: Beverly Smith and Michelle Lovasz.