Clear Water Inspection Program
Introductions

• WHKS & Co. is a multidisciplinary Civil Engineering Firm headquartered in Mason City, Iowa, with offices in Ames, Rochester MN, East Dubuque, West Des Moines & Springfield IL.

• Angie Kolz, PE is practice area leader for WHKS & Co water/wastewater department. WHKS has assisted over 30 Iowa and Minnesota communities with sump pump I&I reduction projects.
Presentation Objectives

- Why is a sump pump program being recommended?
- Discuss program details
- Discuss next steps
What is I/I?
Inflow and Infiltration
Some Sources of I/I

- Roof Drain
- Sump Pump
- Yard Drain
- Foundation Drain
- Catch Basin
- Leaky Lateral
- Leaky Manhole
- Pipe Defects

○ Direct
○ Indirect
Eldora System Description:
Average Dry Weather (ADW) flow (MGD): 0.7
Average Wet Weather (AWW) flow (MGD): 1.5
Peak Instantaneous Wet Weather (PIWW) flow (MGD): 3
Bang for your Buck

Sump Pumps
Smoke & Dye Testing
Manhole Repairs – Casting & Chimneys
Pipe and Manhole Repairs of Active Leaks
Manhole Barrel or Other Pipe Repairs
Upsize Trunk Lines
Upsize Lift Stations
Upsize Wastewater Treatment Plant

I/I Removed Per $$ Spent

More
Less
Example Flow Removal & Cost
Public Sector vs. Private Sector

Sources of I/I vs. Cost to Remove I/I

Example from Kutzky/Slatterly Pilot I/I Study, Rochester MN 2008
National averages range from 50/50 - 75/25
Why a Sump Pump Program?

- A few sump pumps can make a big difference
  - Typical sump pump 20-100 gpm apiece
  - Typical 8” sewer capacity 350 gpm.
  - As few as FOUR pumps can take up the pipe capacity and cause a backup in the neighborhood.

Remaining Capacity for Sanitary Flows?

- 20-100 gpm (Sump # 4)
- 20-100 gpm (Sump # 3)
- 20-100 gpm (Sump # 2)
- 20-100 gpm (Sump # 1)
The trouble with sump pumps

Submitted by admin on Mon, 11/25/2019 - 11:53am

By Rick Patrie

ELDORA - A single sump pump evacuating a common house footing drain can contribute over 7,000 gallons of water to sanitary sewer systems in a 24-hour period, the equivalent of the average daily sewer flow from 26 homes.

All that said, at least 1,100 Eldora residences and businesses will be required to have their sump pumps inspected beginning next spring in an effort to save money on water treatment.

Read the full article in the November 26 edition of the Eldora Herald-Ledger.

The city wastewater treatment plant treats all water like wastewater, so an introduction of large amounts of essentially clean rainwater into the sewer collection system just adds an unnecessary and costly burden on the wastewater treatment system.
Why a Sump Pump Program?

Perspective:
- 5%-10% violation rate typical out of 20,000 inspections completed in thirty communities

- Hypothetically, if 5% rate applied to Eldora’s proposed 2020 inspection area:
  - Approx. 1100 homes x 5% = 55 violations
  - If each pump contributed 20 gpm, 6 hours/day = 396,000 gpd
  - 2020 sump area = 13% Peak Wet Weather at WWTP (0.4 MGD / 3 MGD PHWW = 13%)
Why a Sump Pump Program?

• Sump pump programs are typically the MOST cost effective method to reduce I/I in the system
  – CIPP line sewer and rehab manholes @ $25,000/block
  – Upsize sewer @ $40,000/block (pipe only)
  – The cost of the current program is equivalent to approximately 1.5 block of upsized sewer.

• Cheaper to reduce wastewater than transport and treat
  – Duluth, MN Study - $4/gal to treat, $1/gal to remove
Why a Sump Pump Program?

Talking Points

• The jump in flows during wet weather is evidence that clear water is entering the system.

• I/I sources are typically 50/50 Public vs Private, recent studies as high as 25/75 Public vs Private

• Removing Inflow/Infiltration (I/I):
  – Reduces Backups
  – Protects Health
  – Controls Costs
  – Room for Growth
Sump Pump Program Approach

• Public Information and Education is KEY!
• Ordinance Revisions *completed*!
• Public Info
• Public Meetings
• Scheduling & Inspections
Ordinance

- Chapter 100 of the Eldora municipal code prohibits the discharge of storm water (Clear water) into the sanitary sewer, this includes from the following:
  - Sump Pumps
  - Beaver drains
  - Gutters
  - Driveway Drains

- 30 days to inspect, 30 days to correct. City representative or private plumber can inspect

- $100 per month surcharge until inspection passed
SUMP PUMP INSPECTION PROGRAM
Updated 02/05/2020

**NEWS**
A Public Informational Meeting will be held on Saturday, Feb. 11th, 5:00 pm at Eldora City Hall.
Meeting will discuss the scheduling of inspections, length of inspections, proper sump pump connections and other miscellaneous items.
Information from the meeting will be posted in the Public Notice section after the meeting.

Why is this important?
Due to high wastewater flows in the sanitary sewer system during wet weather, the City of Eldora has adopted an ordinance prohibiting the discharge of clear water into the sanitary sewer system. Clear water from any roof, surface, ground, sump pump, footing tile, overdraining area, seepage collection system ("beaver system") or other natural precipitation is prohibited from discharging into the sanitary sewer.
The City will be conducting mandatory inspections citywide to verify that sump pumps, roof drains, and other potential sources of wastewater are all working properly. Excess clear water may cause private sewage lift stations and other related problems.

Water Inspection Program – Public Information Meeting
Underwater flows in the sanitary sewer system during wet weather, the City of Eldora prohibited the discharge of clear water into the sanitary sewer system. Clear water from any roof, surface, ground, sump pump, footing tile, overdraining area, seepage collection system ("beaver system") or other natural precipitation is prohibited from discharging into the sanitary sewer.

To be conducted mandatory inspections citywide to verify that sump pumps, roof drains, and other clear water sources are not connected to the sanitary sewer system. After clear water sources are connected to the sanitary sewer system, the City of Eldora will be able to provide better service to the residents of the city.
January 30, 2020

Re: 2020 Clear Water Inspection Program – Public Information Meeting

Due to high wastewater flows in the sanitary sewer system during wet weather, the City of Eldora has adopted an Ordinance prohibiting the discharge of clear water into the sanitary sewer system. Clear water from any roof, surface, ground, sump pump, footing tile, swimming pool, seepage collection system (“beaver system”) or other natural precipitation is prohibited from discharging into the sanitary sewer.

The City will be conducting mandatory inspections Citywide to verify that sump pumps, roof drains, and other clear water sources are not connected to the sanitary sewer system. The engineering firm, WHKS & Co., is coordinating this program and will serve as Project consultant.

**Public Informational Meeting:** The City will host a public informational meeting on Tuesday, February 11, 2020 at 5:00 pm at Eldora City Hall to discuss the scheduling of inspections, length of inspection, proper sump pump connection and other miscellaneous items.

Thank you for your attention to this matter. If you have any questions, or require any additional information, please do not hesitate to contact Angie Kolz, WHKS & Co., phone (515) 663-9997, or Eldora City Hall at (641) 939-2393.

Sincerely,

Kelly Haskin
Public Works Director
Why are we doing this program?

- Cheaper to reduce wastewater than to transport and treat
- Sewer replacement to upsize pipe, ~$40,000 per block
  - (2.5 blocks for cost of this program)
- Duluth, MN Study - $4/gal to treat, $1/gal to remove
Scheduling

• All inspections are scheduled, no door-to-door inspections.

• Scheduling is fast and easy

• Schedule through website or telephone
  – EldoraSump.com or toll free telephone

• Residents will receive a letter when it is time for their ward to schedule inspections.
Residents will receive a letter when it is time to schedule inspection.
Residents will receive a letter with login when it is time to schedule an inspection.
The Inspection

• Completed in under 15 minutes, many under 5 minutes

• Adult must be present

• Inspector looks at:
  – Sump pumps
  – Beaver drains
  – Roof drains
  – Site grading

• Occupant and inspector signs

• Notice of Violation and instructional diagrams given if needed
City of Eldora
Sump Pump Inspection Report

A. Initial Inspection

1. Owner and Address:
   a. Owner Name(s):__________________________
   b. Address:__________________________
   c. Occupants Name (if different):__________________________
   d. Owner Address (if different):__________________________

2. Date of Initial Inspection:__________________________

3. Date of construction and Building Type? Building built in year ________________ (ex. 1959)
   Note: residential, apt., commercial, industrial:

4. History of backups or flooding? Note date, source, and actions taken:

5. Does building have:
   a. Yes / No Exterior grading sloping towards the building?
   b. Yes / No Roof drain that go into the ground?
   c. Yes / No Basement?
   d. Yes / No Seepage collection (beaver) system?
   e. Yes / No Sump pit?

6. If building has a roof drain that goes into the ground, which of the following apply?
   a. It is properly constructed to discharge to open air or storm system.
   b. It is improperly constructed to discharge into the sanitary sewer system.
   c. Discharge location not determined.

7. If there is a seepage collection (beaver) system, which of the following apply?
   a. It is properly constructed to discharge into a sump pit.
   b. It is improperly constructed to discharge into the sanitary sewer system.
   c. Discharge location not determined.

8. If there is a sump pit, which of the following apply?
   a. Pump is properly plumbed to discharge outside the basement through rigid piping.
   b. Pump is improperly plumbed to discharge into the sanitary sewer system.
   c. Pump has the capability of discharging into the sanitary sewer system (ex. flex hose).
   d. There is a pit with no pump. Plumbing is checked as (a) (b) or (c) if present.
   e. Discharge location not determined.

9. Other comments (exterior drains, uncapped cleanouts, inactive sump pit, etc.):

10. Photos taken of interior sumps and collection system, and building exterior? Yes / No

11. If 6b, 7b, 8b or 8c was checked, a Violation Notice was given to the Occupant or Owner directing them to correct the violation by (date):

PASS _______ FAIL _______ City Follow-Up _______

B. Subsequent Inspection

1. Date of subsequent inspection:__________________________

2. Inspection conducted by:__________________________

3. Does the building now comply with the applicable Ordinance for the City of Eldora?
   Yes / No

I hereby verify that the City Representative has inspected the above-described sump pump and the information set forth above is true and correct to the best of my knowledge.

Occupant/Owner
Date __________________________

City Representative
Licensed Plumber, sign with license #
Date __________________________

I hereby verify that the City Representative has inspected the above-described sump pump and the information set forth above is true and correct to the best of my knowledge.

City Representative
Licensed Plumber, sign with license #
Date __________________________
Inspector Identification

- All inspections are scheduled
- No door-to-door
- WHKS logos on
  - Badges
  - Clothing
  - Vehicles
Installation Examples: Sump Pumps

- Rigid Pipe to Outside  
  *PROPER*

- Flex Hose to Drain  
  *IMPROPER*
Installation Examples: Sump Pumps

- Rigid Pipe to Outside
  *PROPER*

- Flex Hose to Outside
  *IMPROPER*
Installation Examples: Sump Pumps

- Rigid Pipe to Outside
- PROPER
- Flex Hose to Sanitary via stool

No.
Installation Examples: Beaver Drains

– Beaver Drain to Sump Pit
  *PROPER*

– Beaver Drain to Floor Drain
  *IMPROPER*
Installation Examples: Beaver Drain / Tile

– Tile into Floor Drain under Cover

IMPROPER
Installation Examples: Tile Pit

Tile Pit into Floor Drain

“Running Trap”

IMPROPER

Plugged + Pump Installed

PROPER
Discharge Options

Flexible Pipe
Discharge Options

- Curb outlet
Discharge Options

• Air Gap & underground pipe
Discharge Options

Legal, but not a good idea
Discharge Options

Many options exist for discharge lines!
Any questions, call WHKS, City, or your local plumber!

Visit EldoraSump.com For Pictures, Diagrams, and MORE!
Sump Pump Diagrams
## Ordinance & Inspection Timeline

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinance Revision</td>
<td>2019</td>
</tr>
<tr>
<td>Council Kickoff / Public Info Meeting</td>
<td>Feb 11, 2020</td>
</tr>
<tr>
<td>Inspections: Inspections Begin</td>
<td>March 2020</td>
</tr>
<tr>
<td>Inspections: Inspections Complete</td>
<td>Nov 2020</td>
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</tbody>
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Contact and Project Information

- Contact/Project information
  - Angie Kolz, PE; akolz@whks.com

- City of Eldora Public Works Director
  - Kelly Haskin; 641-939-2393; khaskin@eldoraiowa.com

- Visit [EldoraSump.com](http://EldoraSump.com) For Pictures, Diagrams, & More!