

# Council Kickoff Meeting



## Sump Pump Inspection Program

**City of Boone, IA**  
**February 4, 2019**



# Introductions



- **WHKS & Co. is a multidisciplinary Civil Engineering Firm headquartered in Mason City, Iowa, with offices in Ames, Rochester MN, East Dubuque & 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.**

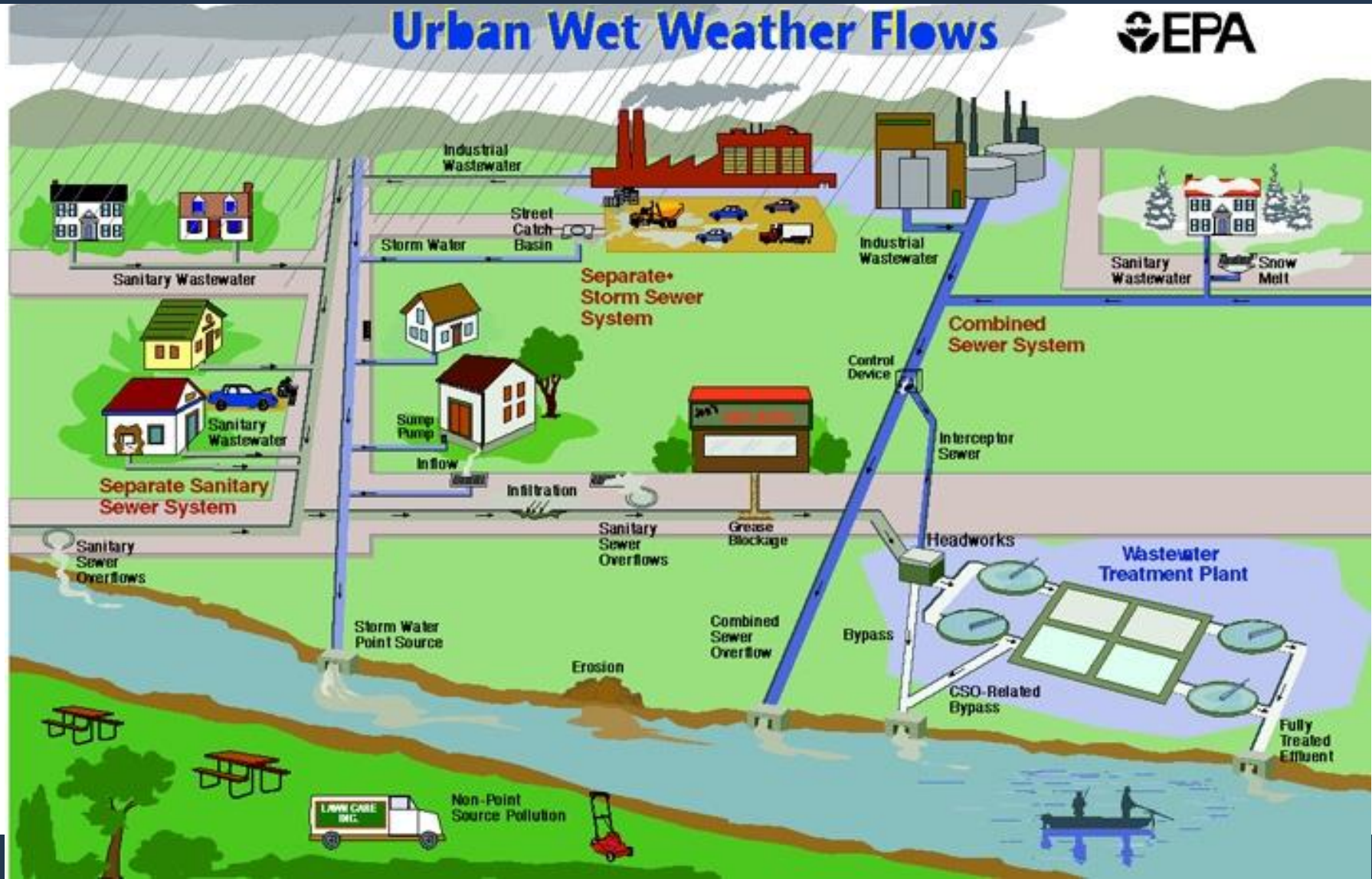
# Presentation Objectives



- **Why is a sump pump program being recommended?**
- **Discuss program details**
- **Discuss next steps**
- **Give Council 'talking points' on program**
- **Brief overview of Long Range I/I Plan**

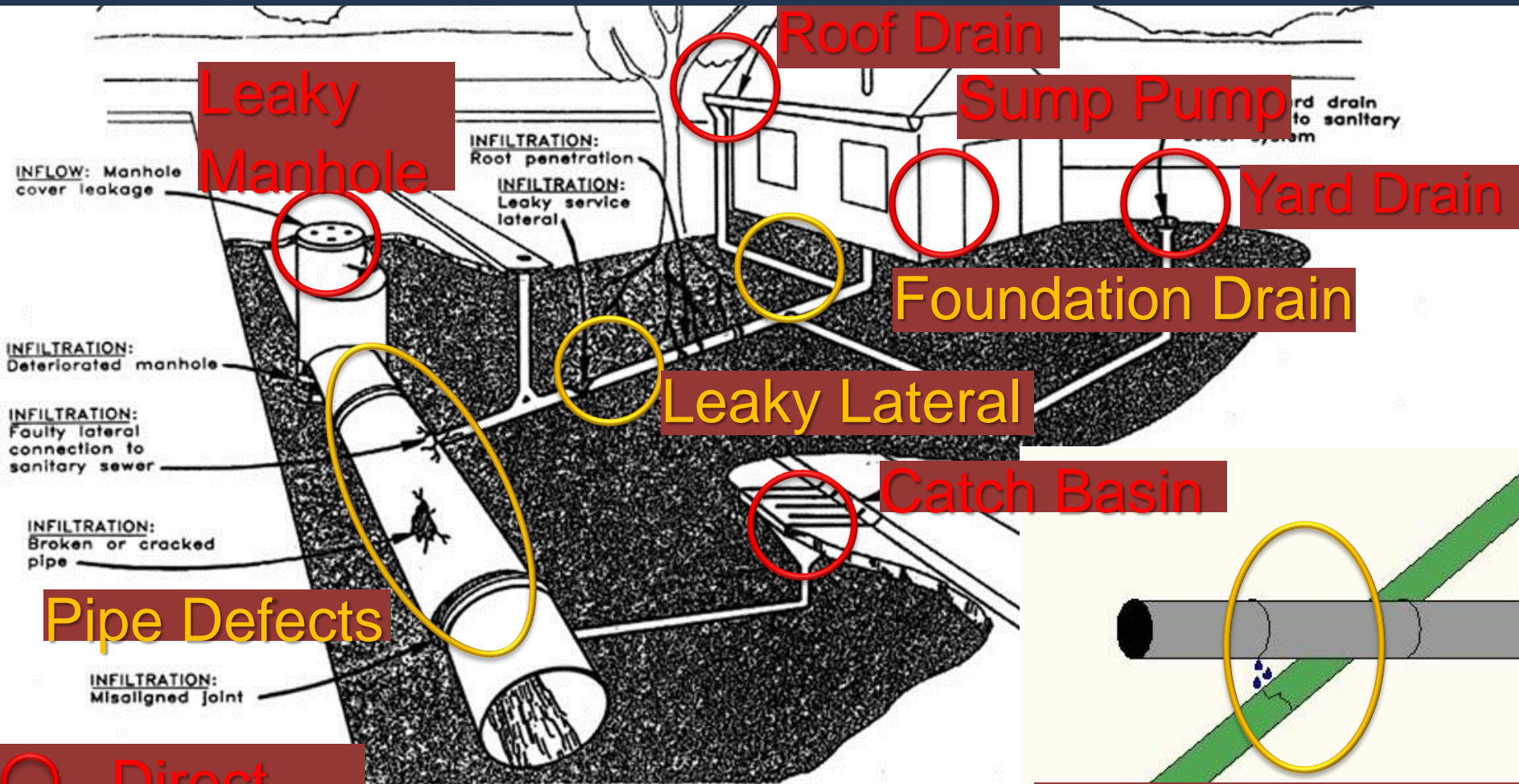
# What is I/I?

## Inflow and Infiltration





# Some Sources of I/I



○ Direct  
○ Indirect

**SANITARY SEWER PROBLEMS**

[www.ci.berkeley.ca.us](http://www.ci.berkeley.ca.us)

Indirect  
Connection

# Inflow and Infiltration

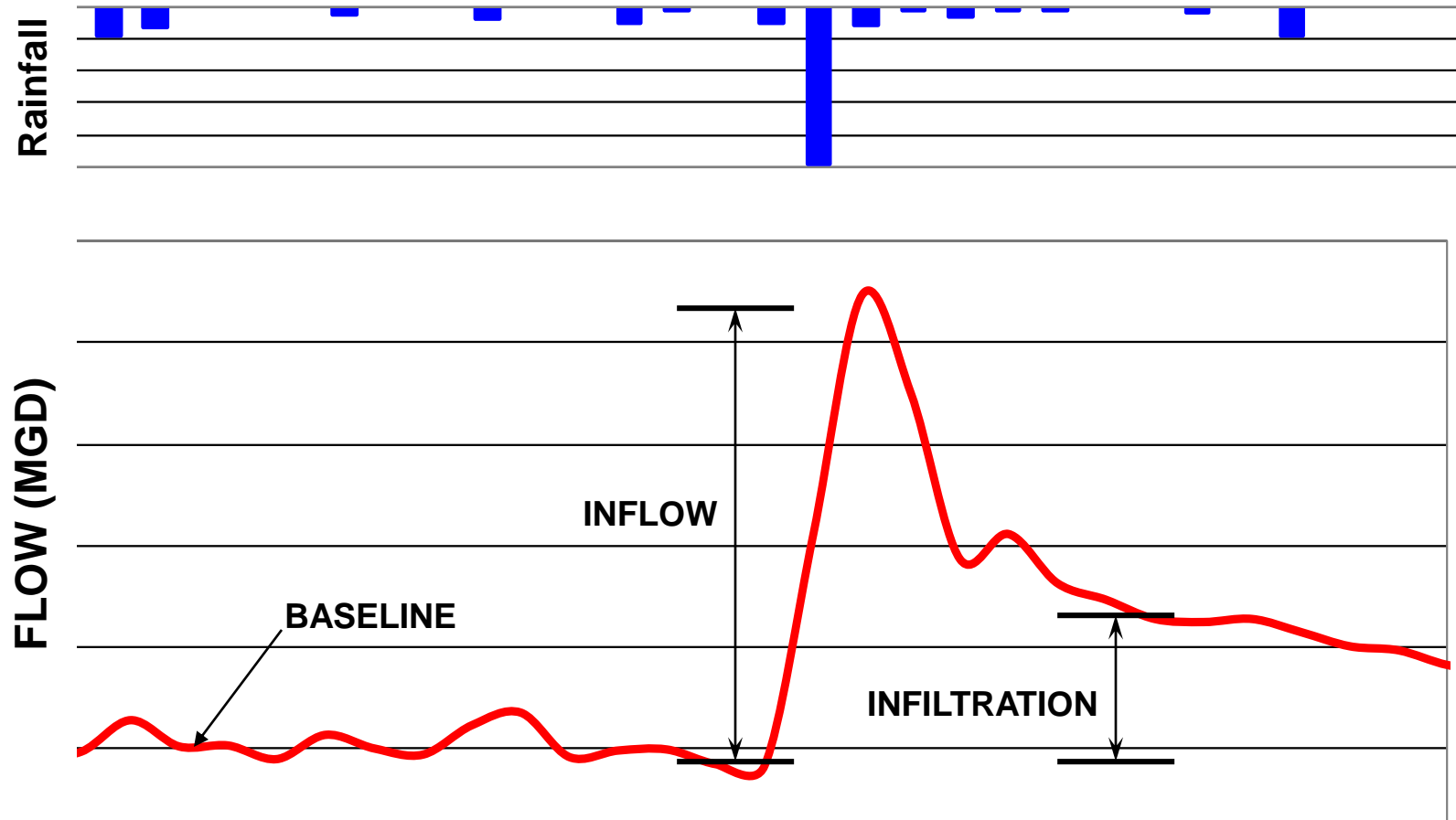


## Boone System Description:

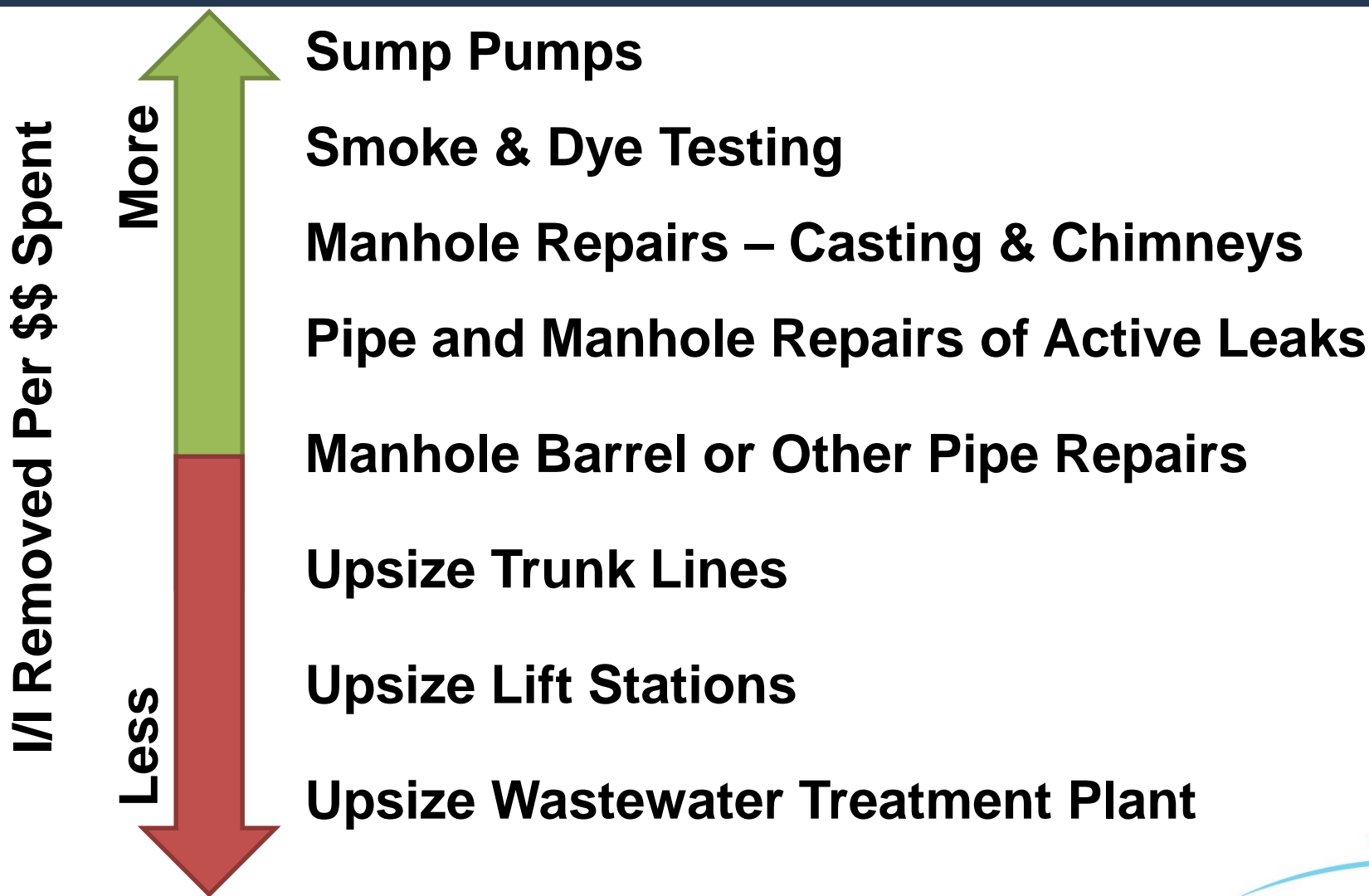
Average Dry Weather (ADW) flow (MGD): 2.1

Average Wet Weather (AWW) flow (MGD): 7.0

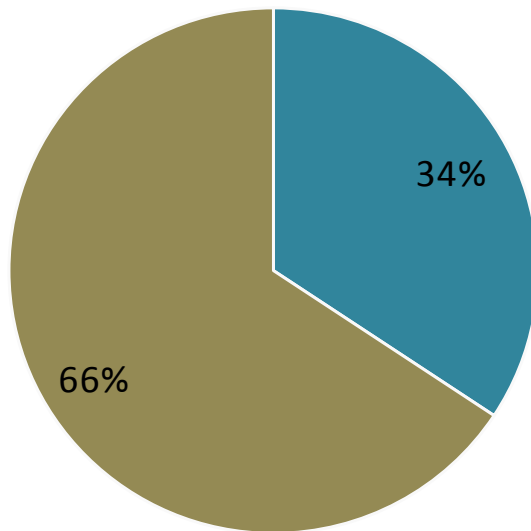
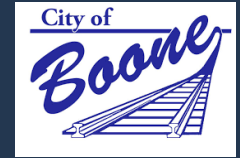
Peak Instantaneous Wet Weather (PIWW) flow (MGD): 24.6 **1170%**



# Bang for your Buck



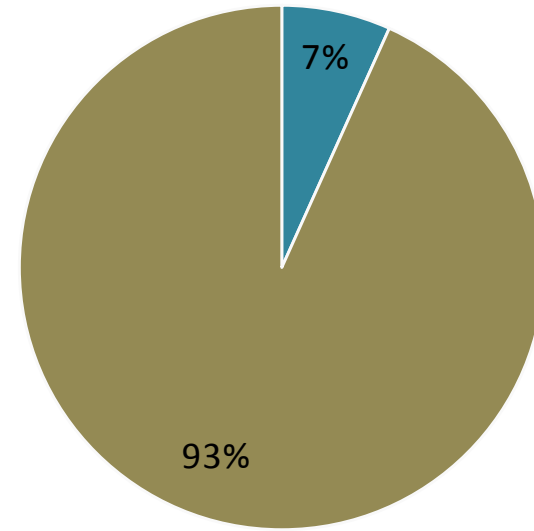
# Example Flow Removal & Cost Public Sector vs. Private Sector



■ Private ■ Public

**Sources of I/I**

**vs.**



■ Private ■ Public

**Cost to Remove I/I**

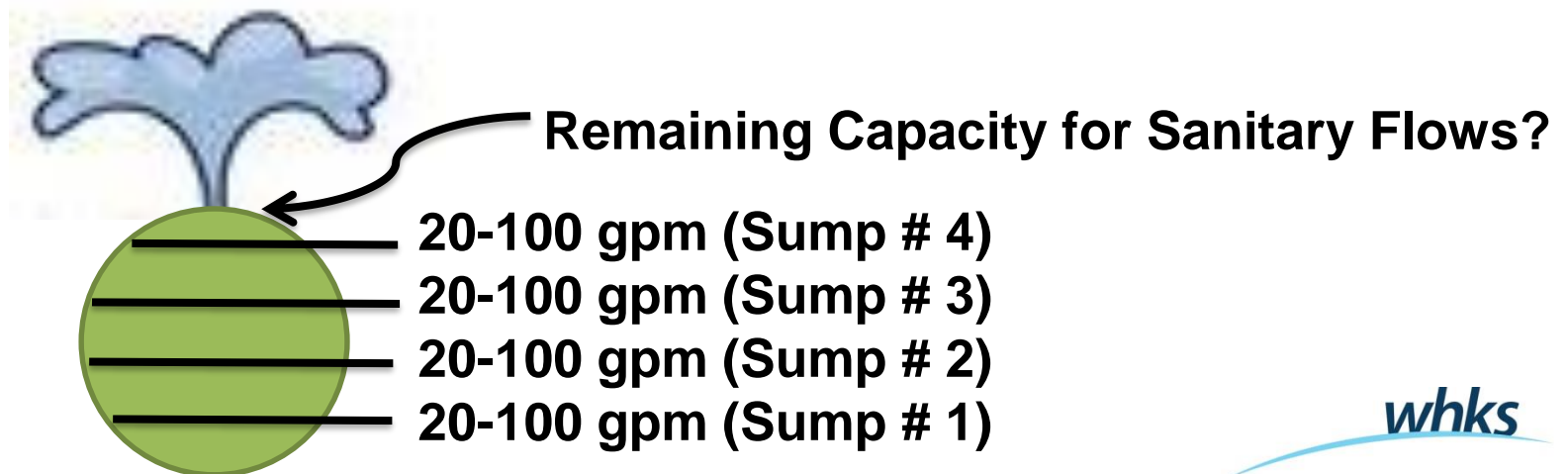
Example from Kutzky/Slatterly Pilot I/I Study, Rochester MN 2008  
National averages range from 50/50 - 75/25





# 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.**



# Why a Sump Pump Program?



## Perspective:

- **5%-10% violation rate typical out of 17,000 inspections completed in thirty communities**
- **Hypothetically, if 5% rate applied to Boone's proposed 2019 inspection area:**
  - **Approx. 600 homes x 5% = 30 violations**
  - **If each pump contributed 50 gpm, 8 hours/day = 720,000 gpd**
  - **2019 sump area = 10% of Average Wet Weather at WWTP (0.72 MGD / 7 MGD AWW = 10.3%)**

# 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 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**

# Sump Pump Program Approach



- **Public Information and Buy-in is KEY!**
- **Ordinance Revisions *completed!***
- **Public Info**
- **Public Meetings**
- **Scheduling & Inspections**

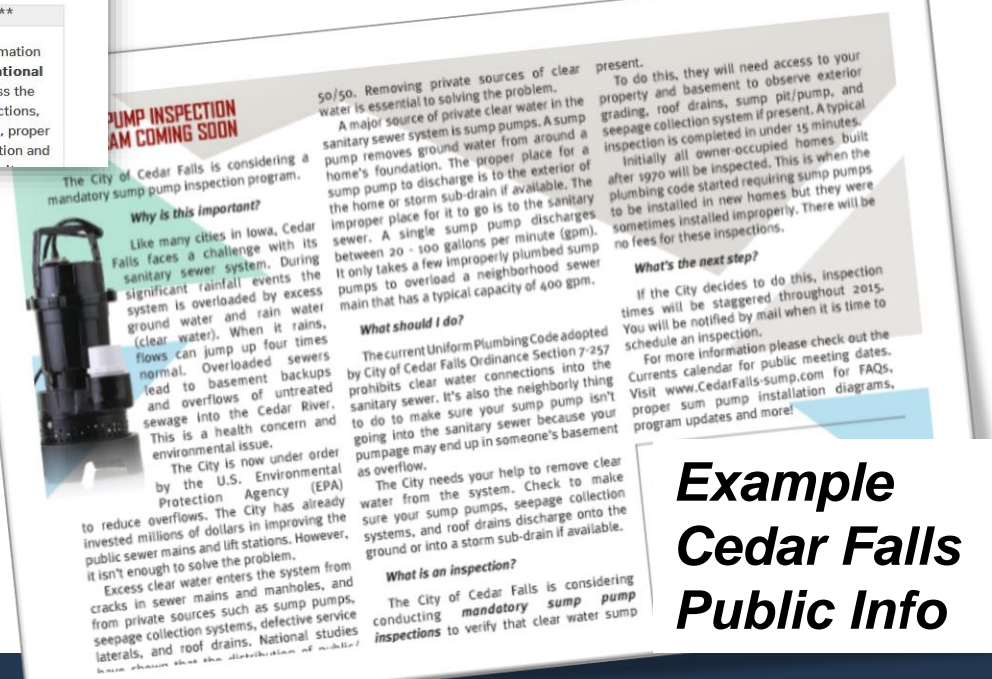
# Public Info



**A successful program depends on Council and public support.**

**A successful program benefits the City by**

- reducing backups,
- protecting health, and
- Controlling costs



**Example Cedar Falls Public Info**





**EXAMPLE**

To: Resident

RE: Sump Pump Inspection Program

Dear Property Owner:

Due to high wastewater flows in the sanitary sewer system during wet weather periods, the City of Iowa Falls has adopted an Ordinance regulating 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 will be prohibited from discharging into the sanitary sewer.

The City, through its consultant, will be conducting **mandatory sump pump inspections** of all buildings 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.

The City will host a **public informational meeting May 3<sup>rd</sup>, 2010 at 6:30 pm at the Fire Station at 318 South River Street** to discuss the scheduling of inspections, length of inspection, proper sump pump connection and other miscellaneous items.

Why is the City conducting the sump pump inspections?

- Sump pump programs are typically the MOST cost effective method to reduce clear water from the sanitary sewer collection system.
- Removing clear water from the sanitary sewer
  - Protects your investment in the public infrastructure
  - Reduces the potential for backups and property damage
  - Helps the City increase customer satisfaction
  - Helps to ensure that future residential, commercial and industrial developments can be allowed within the City.
- All buildings will be inspected. A typical inspection is completed in under 15 minutes.

Inspections will take place during 2010 and 2011. The City will be separated into approximately four sectors, designated by a color (red, yellow, green, blue), to stagger inspection times throughout these years. You will be contacted at a later time to inform you of your sector color and to invite you to schedule your inspection.

Your anticipated cooperation is greatly appreciated in completing this program. If you have any questions, or would like to review the Ordinances, Please contact City Hall.

Sincerely,

Brian Weuve  
City Manager

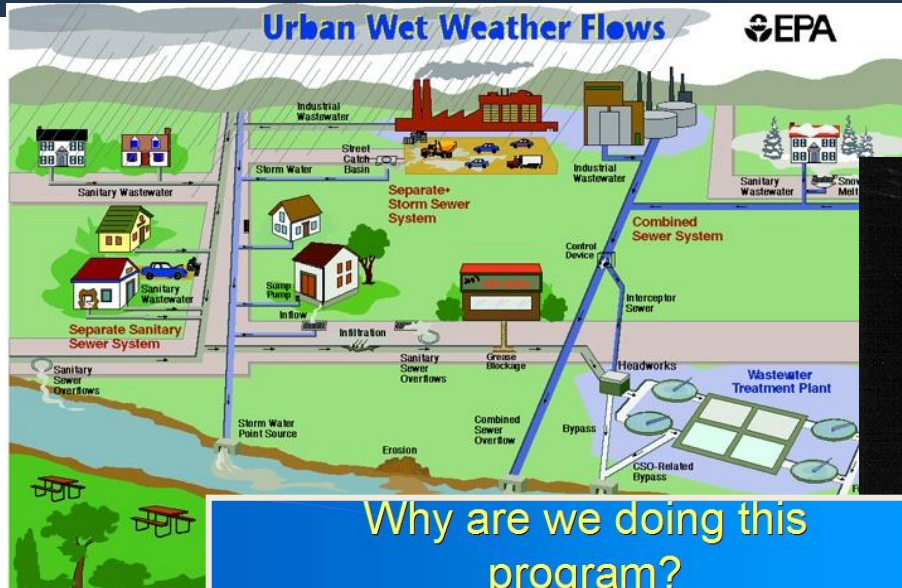
315 Stevens Street  
Iowa Falls, Iowa 50126

641.648.252  
[www.cityofiowafalls.com](http://www.cityofiowafalls.com)

**Example Iowa  
Falls Public  
Info**

Letter

# Informational Meeting



## 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

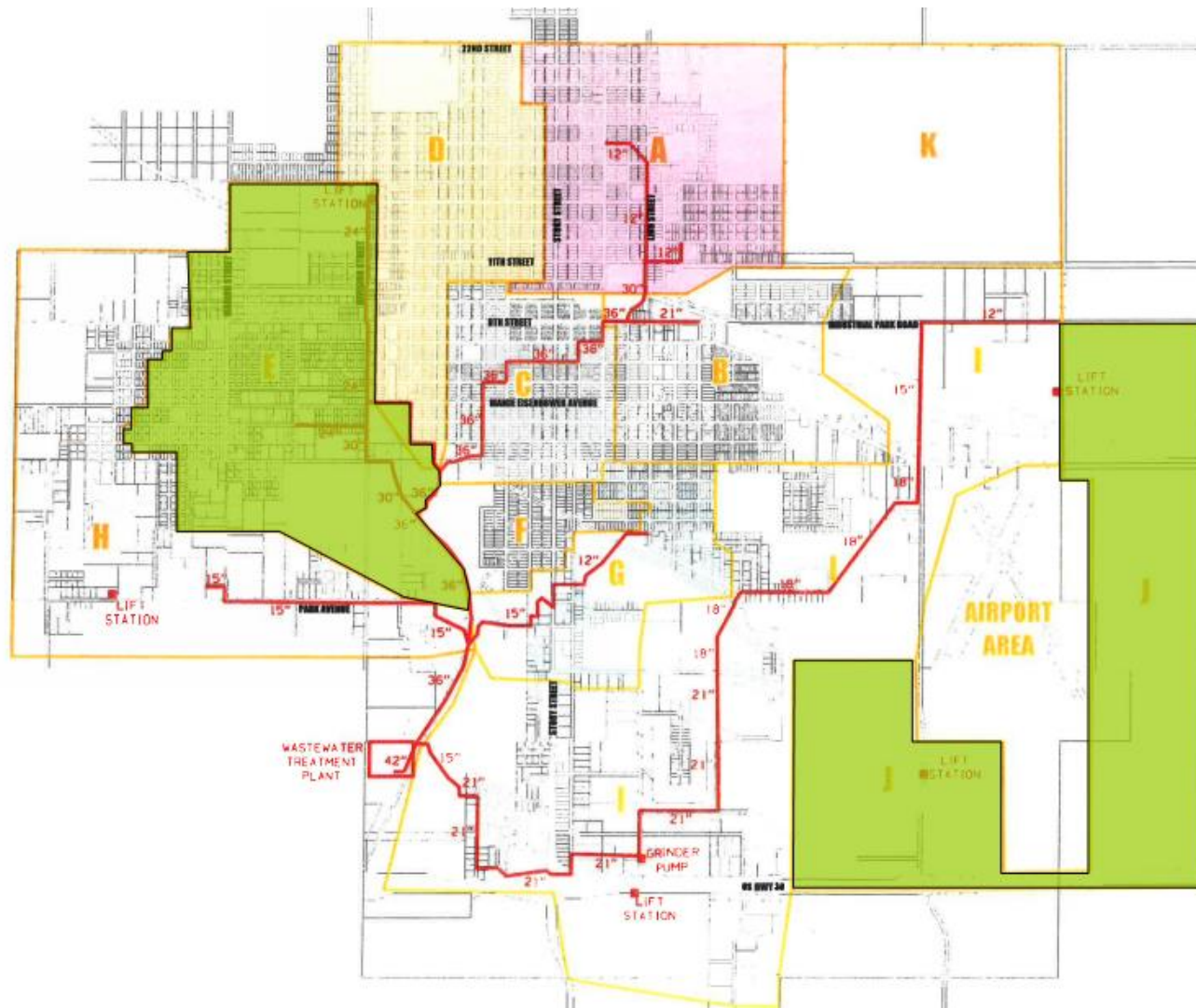
# Scheduling



- **All inspections are scheduled, no door-to-door inspections.**
- **Scheduling is fast and easy**
- **Schedule through website or telephone**
- **Residents will receive a letter when it is time for their sector to schedule inspections.**



# 2019 Sectors



# Scheduling and Info Website

## BooneSump.com

### Find Appointment Availability



June - 2009

	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

#### Available times for 06/03/2009:

- ☐ 12:00 PM - 12:15 PM
- ☐ 12:15 PM - 12:30 PM
- ☐ 12:30 PM - 12:45 PM
- ☐ 12:45 PM - 01:00 PM
- ☐ 01:00 PM - 01:15 PM
- ☐ 01:15 PM - 01:30 PM
- ☐ 01:30 PM - 01:45 PM
- ☐ 01:45 PM - 02:00 PM
- ☐ 02:00 PM - 02:15 PM
- ☐ 02:15 PM - 02:30 PM
- ☐ 02:30 PM - 02:45 PM
- ☐ 02:45 PM - 03:00 PM
- ☐ 03:00 PM - 03:15 PM
- ☐ 03:15 PM - 03:30 PM

# 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**





# Inspection Form

Inspector \_\_\_\_\_  
Plumbing License # \_\_\_\_\_

City of Boone  
Sump Pump Inspection Report

## A. Initial Inspection

1. Owner and Address:
  - a. Owner Name(s): \_\_\_\_\_
  - b. Address: \_\_\_\_\_
  - c. Occupant 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 drains 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 \_\_\_\_\_

Property Address \_\_\_\_\_  
Page 2 of 2



*DIAGRAM: roof drains into ground, exterior drains, improper grading, sump pits and pumps, sump pump discharges, beaver systems, sanitary grinder pumps, etc....*

## 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 Cresco?  
☐ 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 \_\_\_\_\_

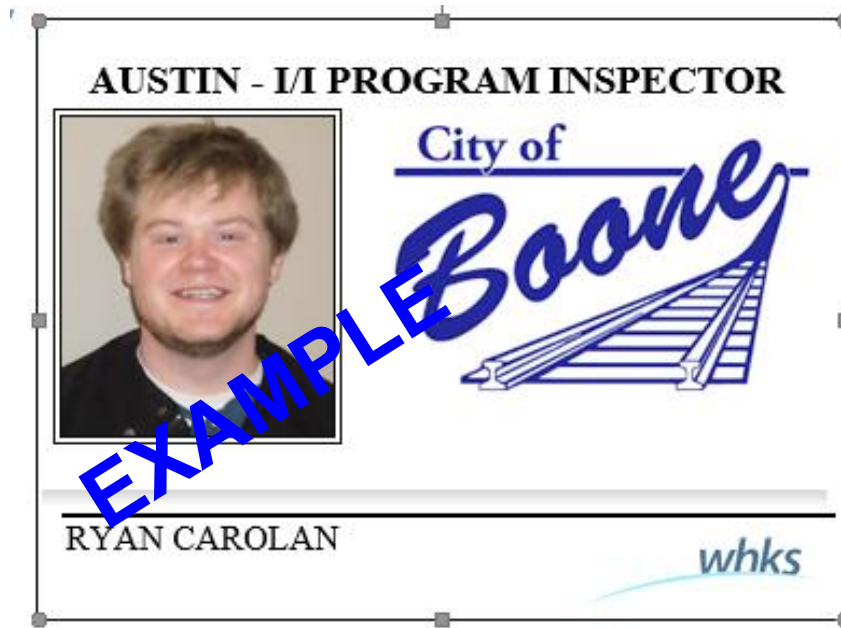
Date \_\_\_\_\_

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 \_\_\_\_\_

Date \_\_\_\_\_

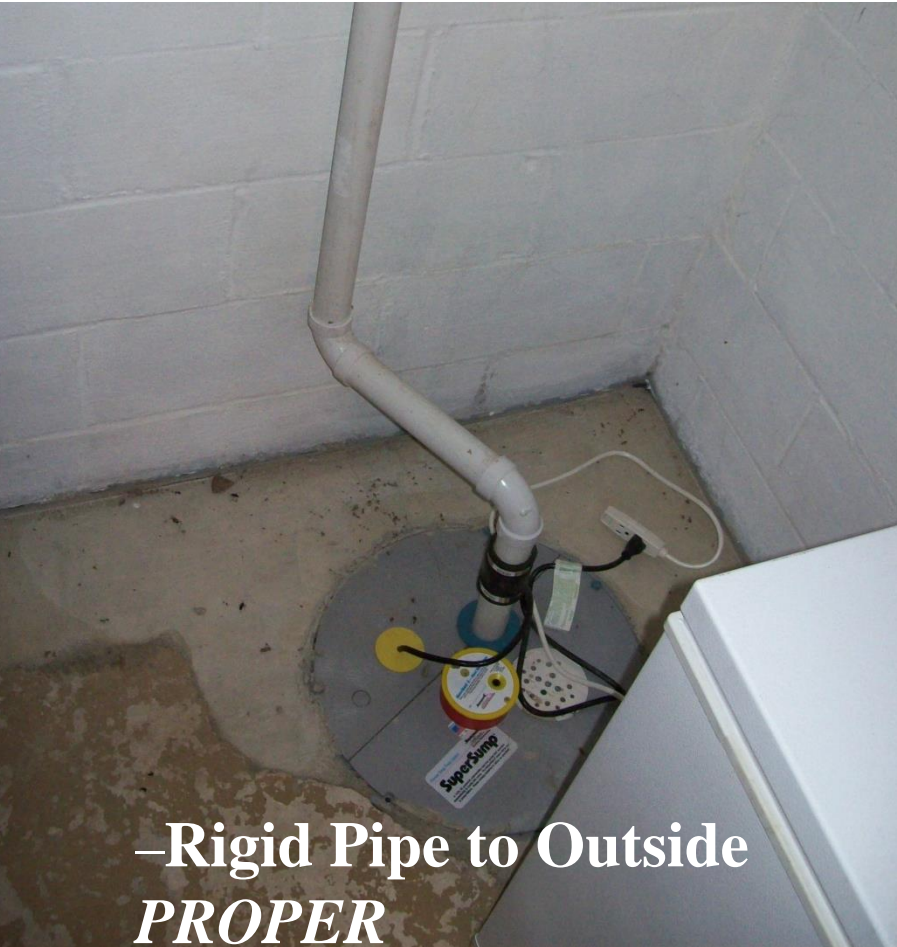
# Inspector Identification



- All inspections are scheduled
- No door-to-door
- WHKS logos on
  - Badges
  - Clothing
  - Vehicles



# Installation Examples: Sump Pumps



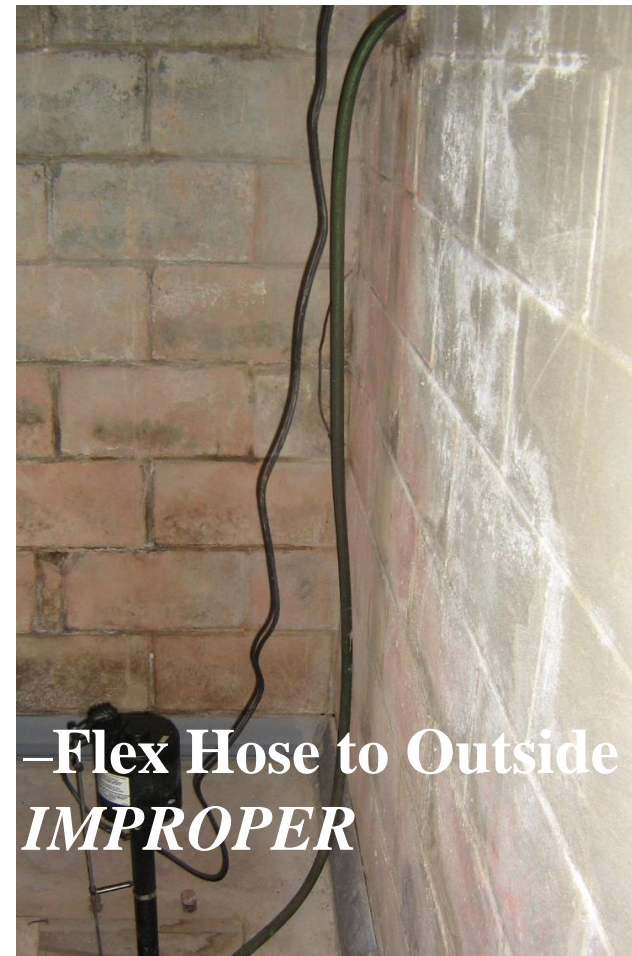
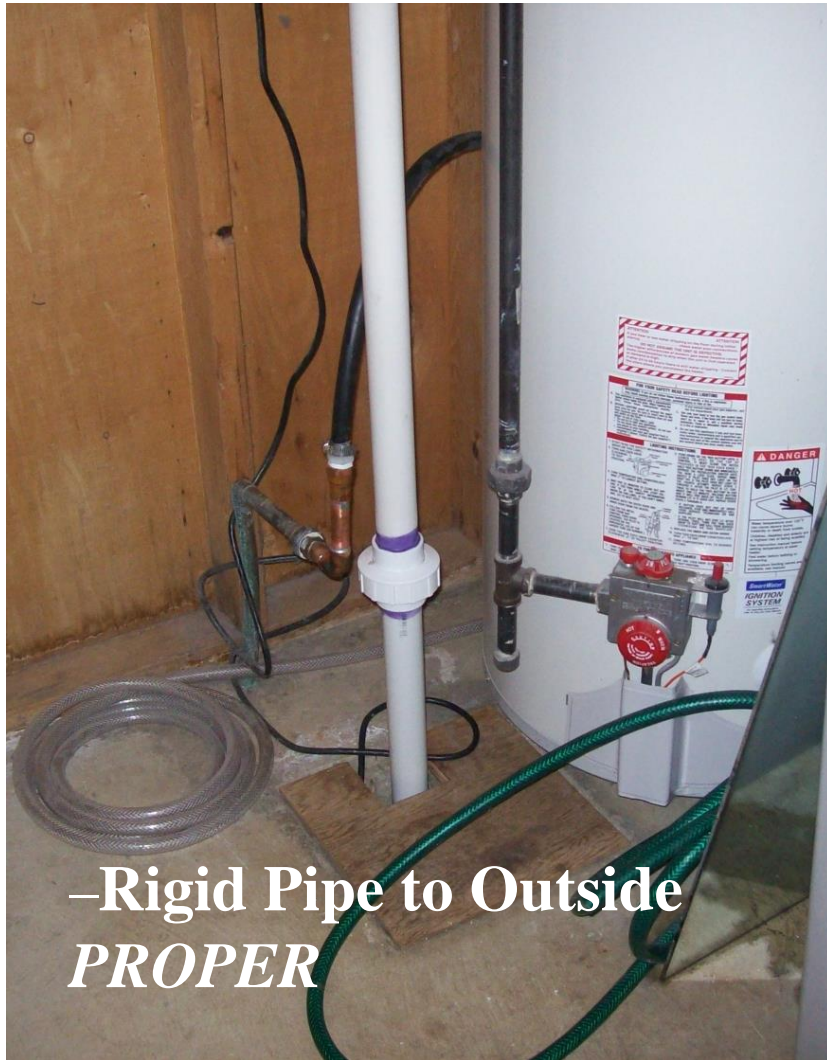
–Rigid Pipe to Outside  
*PROPER*



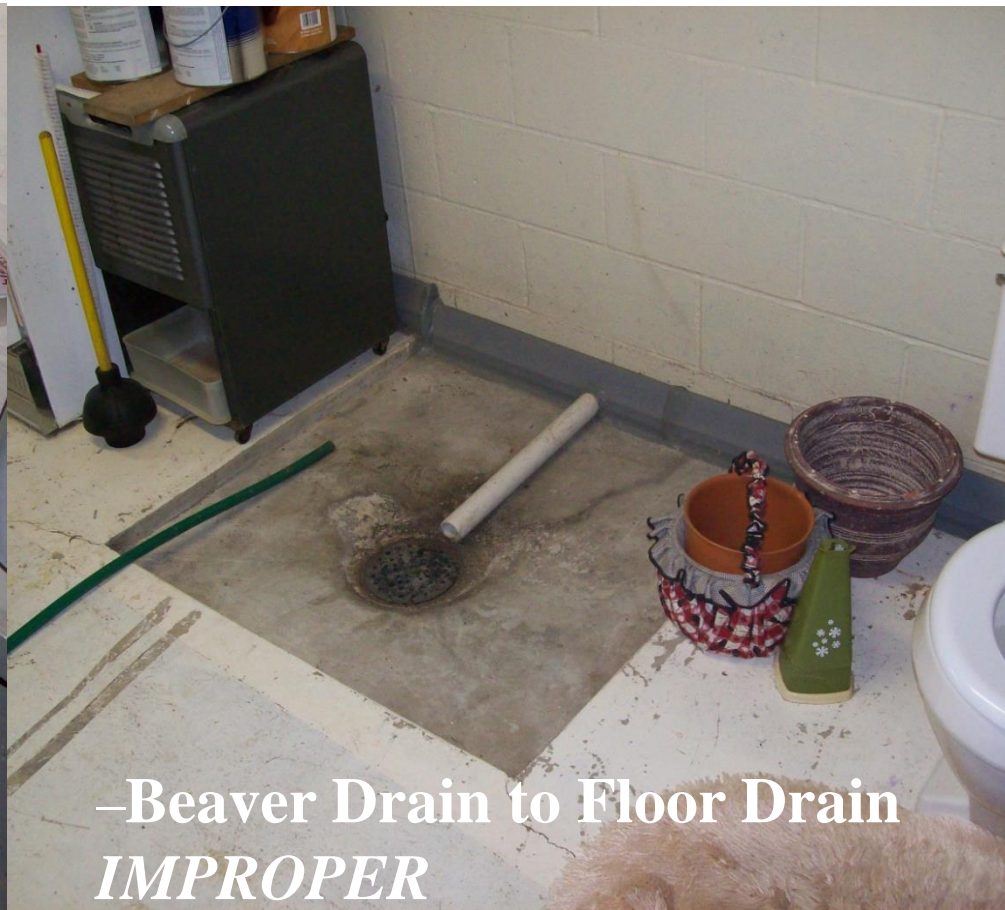
–Flex Hose to Drain  
*IMPROPER*



# Installation Examples: Sump Pumps



# Installation Examples: Beaver Drains





# Installation Examples: Beaver Drain / Tile





# Installation Examples: Tile Pit



Photo courtesy of WCF Courier

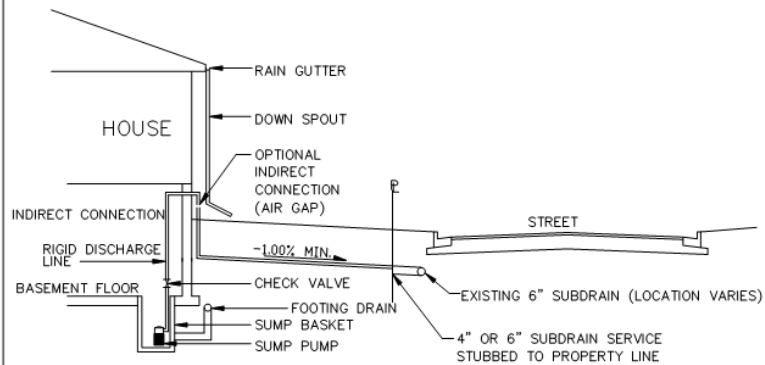
whks

# Sump Pump Diagrams



CITY OF BOONE

## PROPER SUMP PUMP CONNECTION (WHEN CITY SUBDRAIN / STORM SEWER IS AVAILABLE)



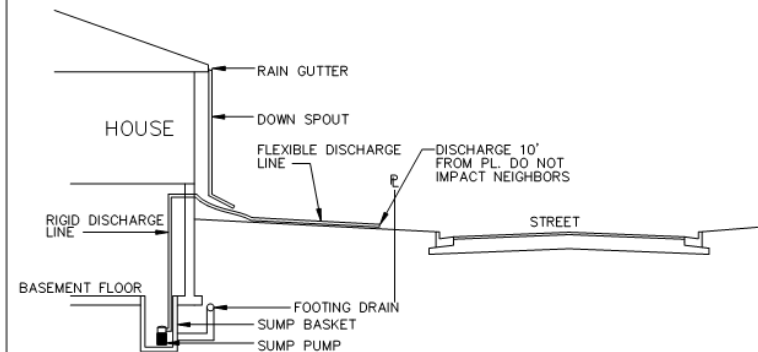
TYPICAL SECTION  
NO SCALE



REV. 5/16/2016

CITY OF BOONE

## PROPER SUMP PUMP CONNECTION (WHEN CITY SUBDRAIN / STORM SEWER IS NOT AVAILABLE)



TYPICAL SECTION  
NO SCALE



REV. 5/16/2016

# Talking Points



- **Sump pump programs are typically the MOST cost effective method to reduce I/I in the system.**
- **A typical inspection is completed in under 15 minutes.**
- **Removing I/I from the sanitary sewer**
  - **Saves Money: Reduces future rate increases**
  - **It's the Neighborly thing to do: Reduces potential for backups & property damage**

# Ordinance Revisions to Support a Successful Program

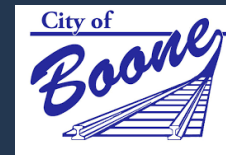


- **Completed!**

# Sump Pump Recommendations



- **Continue Public Info!**
- **Schedule Public Info Meeting**
- **Begin Inspections**



# Ordinance & Inspection Timeline

Item	Date
<b>Council Kickoff Meeting</b>	<b>Feb 4, 2019</b>
<b>Next Public Info Insert</b>	<b>March 2019</b>
<b>Inspections: Mail Invitations to Public Mtg</b>	<b>March 2019</b>
<b>Public Information Meetings</b>	<b>April 2019</b>
<b>Inspections: Inspections Begin</b>	<b>May 2019</b>
<b>Inspections: Inspections Complete</b>	<b>Nov 2019</b>



# Long Range I/I Plan: Field Investigations

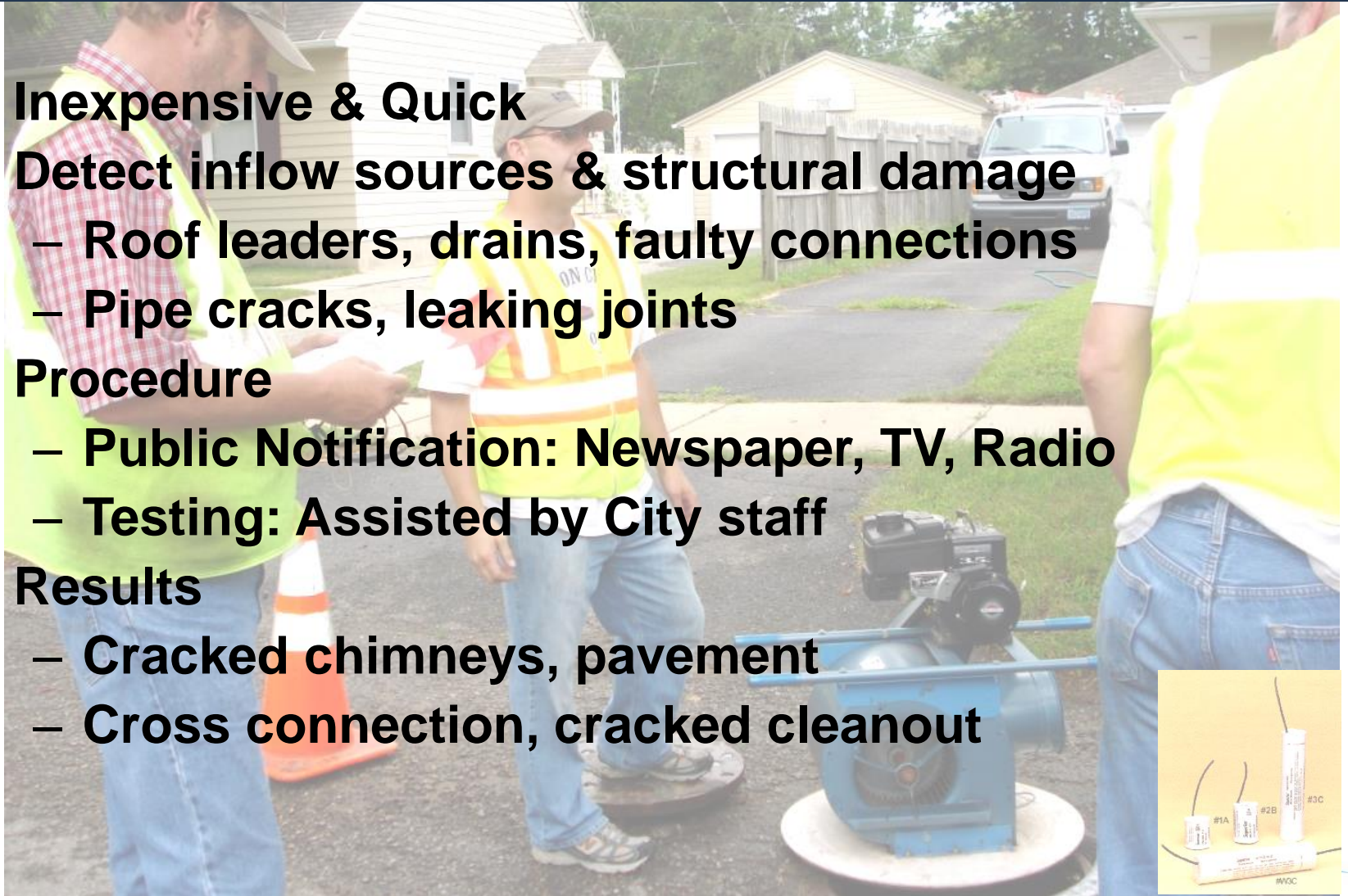


- **Private:**
  - **Building Inspections**
- **Public:**
  - **Smoke and Dye Testing**
  - **Manhole Inspections**

# Smoke Testing



- **Inexpensive & Quick**
- **Detect inflow sources & structural damage**
  - Roof leaders, drains, faulty connections
  - Pipe cracks, leaking joints
- **Procedure**
  - Public Notification: Newspaper, TV, Radio
  - Testing: Assisted by City staff
- **Results**
  - Cracked chimneys, pavement
  - Cross connection, cracked cleanout



# Manhole Inspection



- **I/I defects**
  - **Cover, frame seal, chimney, barrel**
- **Confirmed/updated system configuration**
  - **Location, depth, pipe size**



# Questions?



*whks*

# Contact and Project Information



- Contact/ Project information
  - Angie Kolz, PE

[akolz@whks.com](mailto:akolz@whks.com)

515-450-5359

