

The logo for the Ohio Rural Water Association features the word "Ohio" in a blue, stylized font. The letter "O" is replaced by a graphic of three wavy lines representing water. The letters "h", "i", and "o" are in a simple, sans-serif blue font. Below "Ohio" are the words "RURAL WATER" and "ASSOCIATION" in a bold, sans-serif font. "RURAL WATER" is in yellow and "ASSOCIATION" is in green.

Ohio

RURAL WATER

ASSOCIATION

Smoke Test Training



John Heil

Wastewater Circuit Rider

john@ohiorurlawater.org

740-502-3665



ORWA is a Non-Profit, Member Based Association dedicated to elevating Ohio's Rural Water & Wastewater community.

Since 1976

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Lead & Copper

Revised Total Coliform Rule

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Provides free Energy Efficiency Assessments for Water & Wastewater Systems

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Any & All kinds of assistance for Water Systems

Wastewater Circuit Riders



Any & All kinds of assistance for Wastewater Systems

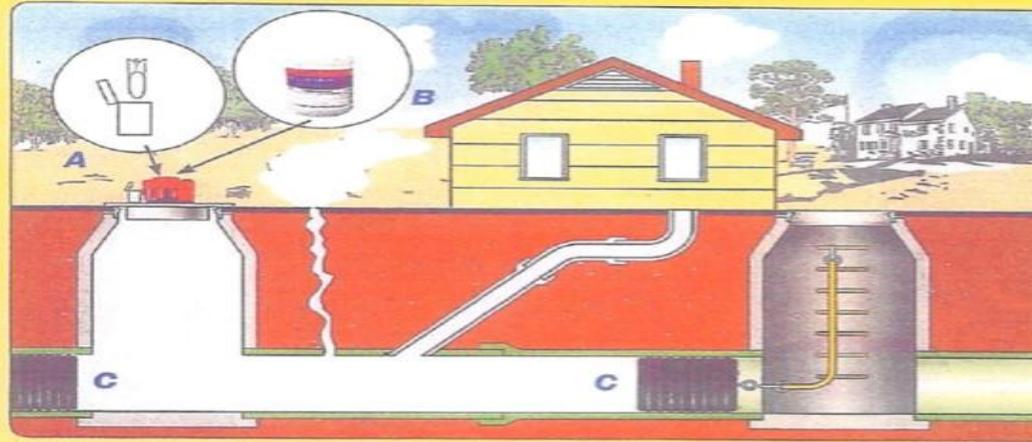
Training Coordinator



Water Quality Action Specialist



IDENTIFYING EXCESS WATER IN SEWER SYSTEMS IS CRITICAL



operator
notes

A = Smoke Candle
B = Smoke Fluid
C = Pipe Plug

Why

Smoke Test

A Short Course on Smoke Testing

Use smoke candles or fluids together with smoke blowers to quickly and easily identify leaks!

Why Smoke Test?

Smoke testing is the most cost effective method to find sources of surface water inflow, the leading cause of wet weather sewer system overflows. Fast and easy to do, smoke testing produces immediate results that can be acted on quickly—often at minimal expense.

Common sources of sewer inflow are:

- Roof downspouts
- Sump pumps
- Leaking manholes
- Abandoned sewer lines
- Cross connected sanitary and storm sewer lines
- Cellar drains
- Yard/foundation drains
- Broken laterals
- Unconnected sewer lines

How Smoke Testing Works

Sewer mains should be broken down to two 600 to 800-ft sections of line. The two sections of line are usually tested simultaneously, with the smoke being introduced through a centrally located manhole. This requires 5 to 6 minutes of smoke generation to provide enough time to walk the test area. Blocking the far side of the upstream and downstream manholes is not required, but is recommended for optimum results and to prevent smoke from going beyond the intended test area.

Smoke under pressure will quickly fill the main and all connected lines and laterals, following the path of least resistance. Only enough pressure to overcome atmospheric pressure is required; smoke will flow through all openings to the surface, and should come out roof vents throughout the test area. Any smoke that is not from a proper vent indicates a fault where surface water can flow into the sanitary sewer.

Smoke tests are effective regardless of surface, type of soil, or depth, provided openings exist for the smoke to follow. For example, it is not uncommon to see smoke exiting from cracks in paved surfaces or lawns, showing points of surface water entry.

Safety: When used as directed, all systems can be used safely. However, there is practically no substance on earth that can be considered 100% safe. All smoke can irritate breathing passages and exposure should be avoided, especially for those with respiratory problems or sensitivities. Before smoke testing, advance notice should be given to community members so arrangements can be made for those in poor health.

Types of Smoke Testing

- ◆ Liquid Smoke
- ◆ Candle Smoke



Liquid

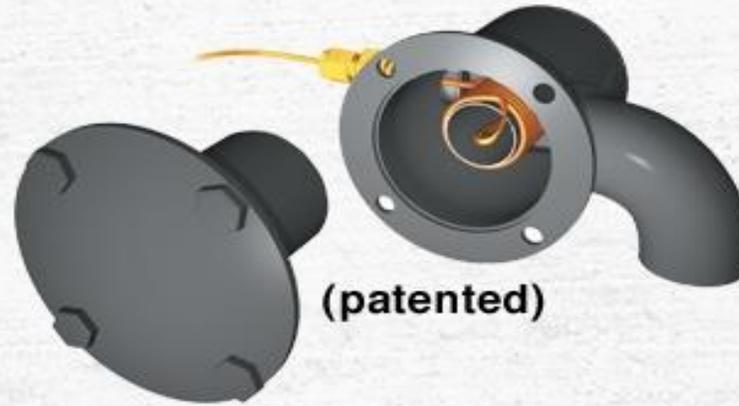
HURCO LIQUISMOKE



SuperJet™

RIPCORD with
SuperJet
The RIPCORD &
Super RIPCORD
just got better
with the Super
Jet.

Now equipped
with the Super
Jet high
performance
muffler.



+

Super heating muffler.

+

Atomizes fluid resulting in nearly a 100% burn.

+

Will double LiquiSmoke performance with half the amount of fluid.

+

Pays for itself with the first 5 gallons of fluid use.

+

Nearly eliminates any residual fluids.



SuperJet[®]
smoke generator
produces more
smoke faster for
less dollars.



**Power
Smoker[®]**
with Liquid Smoker



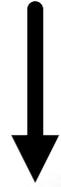
10S Manhole Smoke Blower



Candle

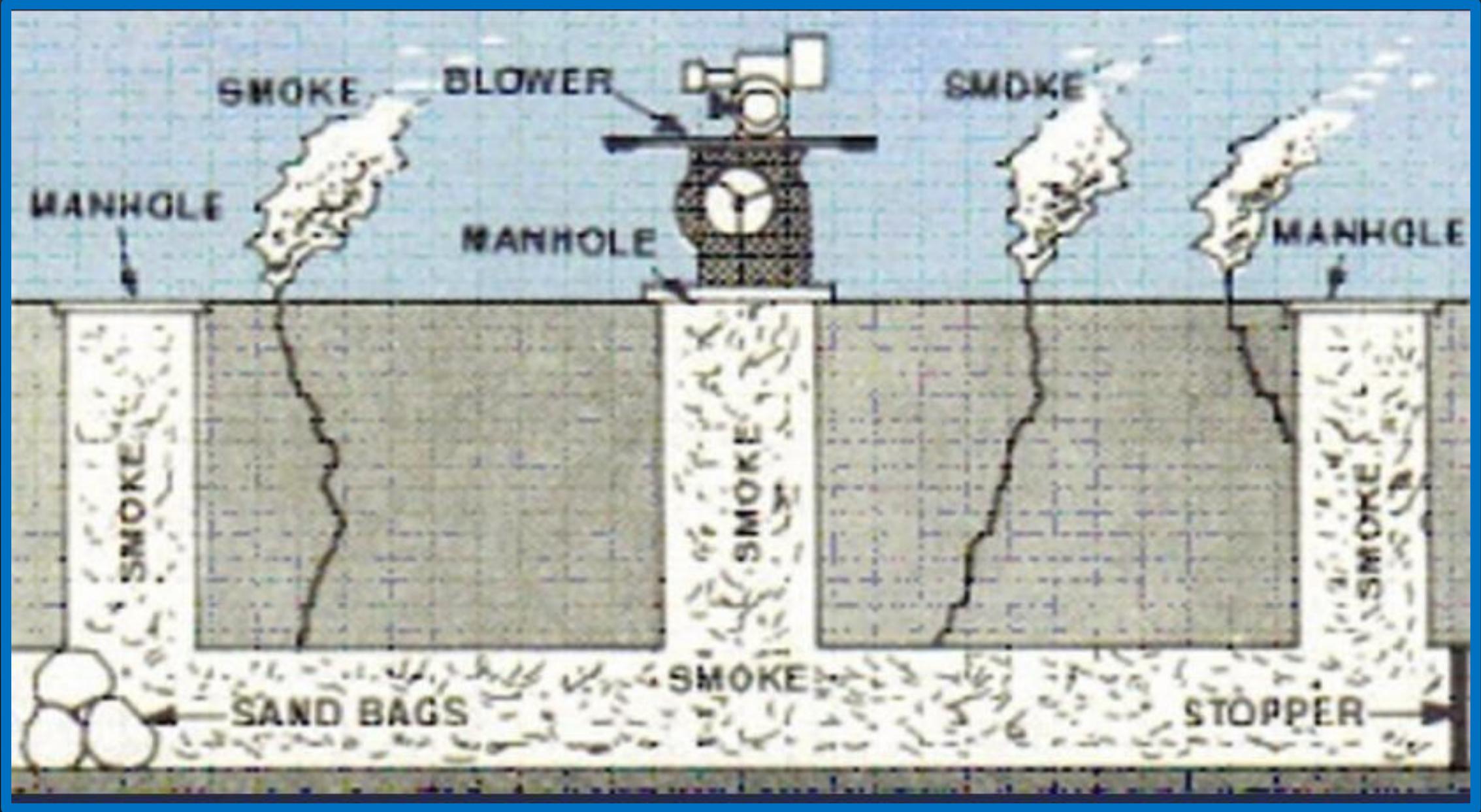


Candle Box









BECKIE HURLEYVICE PRESIDENT
BECKIE@HURCOTECH.COM
605-359-8511**HURCO**
TECHNOLOGIES, INC.®

SDS AND TEST DATA EXPLANATION

Enclosed with this cover letter is a copy of our Safety Data Sheet (SDS - Formerly MSDS) for the liquid form of LiquiSmoke, and a summary of the Maxim Technologies and Wisconsin Occupational Health Laboratory reports on the smoke generated by Hurco's LiquiSmoke.

Please note that only people who are using the "raw" LiquiSmoke (the liquid form) will be concerned with the SDS sheet. People who are exposed to the "smoke" LiquiSmoke only need to be concerned with the Maxim Technologies and WOHL reports. What is important to note on the SDS sheet is Section 11 - Toxicological Information - it is not a potential carcinogen. The "raw" LiquiSmoke does not require any hazardous transportation documentation. ***This product is not listed on the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.***

Since there is not an SDS for products in smoke form, we hired a private, nationally recognized laboratory, Maxim Technologies, Inc. of Sioux Falls, South Dakota, to sample the smoke generated by LiquiSmoke. The samples were sent to the Wisconsin Occupational Health Laboratory where a GC Solvent Scan was performed. Of the 107 items listed in a GC Solvent Scan, only .01 parts per million (PPM) petroleum distillates was found. The OSHA Permissible Exposure Limit (PEL) is 500 ppm. Carbon Monoxide and Carbon Dioxide levels all tested within the OSHA PEL. This information is important to persons being exposed to the "smoke". Even though these test don't identify any harmful quantities of toxic compounds, you will need to warn your customers of dangerous sewer gases that may be traveling with the smoke. They should always be warned to evacuate the premise when smoke is detected.

Finally, we had Maxim Technologies test the smoke generated by our LiquiSmoke for staining and residue. The tests showed that there was no staining or residue caused by LiquiSmoke. Your customers can rest assured that LiquiSmoke will not ruin their furniture or drapery. More information is included in the following document, "Scientific Evaluation of LiquiSmoke".

If you have any questions or concerns about Hurco's LiquiSmoke, please contact me at 1-800-888-1436.

Sincerely,

Beckie Hurley
Vice President

DEMONSTRATIONS,
VIDEOS & MORE

010121

HURCOTECH.com

409 ENTERPRISE STREET - HARRISBURG, SD 57032 - 800-888-1436 - INFO@HURCOTECH.COM

LIQUISMOKEWOHL - COMPOUNDS NOT
FOUND IN LIQUISMOKE**HURCO**
TECHNOLOGIES, INC.®

Wisconsin Occupational Health Laboratory conducted an GC Solvent Scan looking for volatile organic compounds in Hurco's LiquiSmoke

NONE OF THE COMPOUNDS LISTED BELOW WERE DETECTED IN HURCO'S LIQUISMOKE

Acetone	Dioxane (Diethylene Dioxide)	Methyl Acrylate
Allyl Alcohol	Dioxolane - 1,3	Methyl Chloroform
Amyl Acetate (n)	Epichlorohydrin	Methyl Isoamyl Ketone
Amyl Alcohol	Epoxybutane (1,2)	Methyl Methacrylate
Benzaldehyde	Ethyl Alcohol	Methyl Styrene
Benzene	Ethoxyethyl Acetate (2)	Naphta (Coal Tar)
Butatone (2)	Ethyl Acetate	Nonane
Butyl Acetate (n)	Ethyl Acrylate	Octamethylcyclotetrasiloxane
Butyl Acrylate	Ethyl Benzene	Octanol
Butyl Alcohol (n)	Ethyl Butyl Ketone	P-Dichlorobenzene
Butyl Alcohol (Sec)	Ethyl Butyrate	Pentane
Butyl Alcohol (Tert)	Ethyl Ether	Pentanone (2)
Butyl Glycidyl Ether	Ethyl Methacrylate	Perchloroethylene
Butyl Methacrylate	Ethyl Toluene	Petroleum Distillate (Naphtha)
Carbon Tetrachloride	Heptanone-2 (MBK)	Pinene-Alpha
Chlorobenzene	Hexane (n)	Pinene-Beta
Chloroform	Hexone (MIBK)	Propanol
Chloroprene	Hexyl Acetate	Propyl Acetate (n)
Chlorostyrene	Isoamyl Acetate	Styrene
Chlorotoluene (o)	Isoamyl Alcohol	Tetrahydrofuran
Cumene	Isobutyl Alcohol	Toluene
Cyclohexanol	Isobutyl Isobutrate	Trichloro-Benzene (1,2,4)
Cyclohexanone	Isoisopropyl Acetate	Trichloro-Ethane(1,1,2)
Decamethyl Cyclopentasiloxane	Isopropyl Alcohol	Trichloroethylene
Diochloroethane (1,1)	Isopropyl Ether	Vinyl Acetate
Diochloroethane (1,2)	Mesityl Oxide	Xylene (o, m & p)
Diisobutyl Ketone	Methyl Acetate	

DEMONSTRATIONS,
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Scientific Evaluation of LiquiSmoke™

A Summary of the Scientific Evaluation Reports Produced by Maxim Technologies of Sioux Falls, South Dakota

During testing conducted by Maxim Technologies, the following facts concerning the smoke generated by LiquiSmoke were determined, under the guidelines set by The National Institute of Occupational Safety and Health (NIOSH), and the Occupational Safety and Health Administration (OSHA).

During the tests, Maxim Technologies collected a sample of the smoke generated by LiquiSmoke in a charcoal tube. The sample was sent to the Wisconsin Occupational Health Laboratory. A GC Solvent Scan was conducted to determine if the smoke generated by LiquiSmoke formed any hazardous compounds or conditions. The GC Solvent Scan searched for 107 different hazardous organic compounds. Of the 107 items listed, only .01 parts per million (ppm) petroleum distillates was found. The OSHA permissible Exposure Limit is 500 ppm.

Further testing by Maxim Technologies found that the ambient carbon monoxide levels were found to be zero. NIOSH regulations have determined that the "8 hour time weighted average" (TWA) for carbon monoxide to be 35 ppm. During the duration of the test, measurable TWA levels of LiquiSmoke ranged from 4.6 to 7.8 ppm – within the OSHA Permissible Exposure Limit (PEL) set by OSHA.

Maxim Technologies also tested for carbon dioxide levels. Ambient levels were found to be at 330 ppm. The level of carbon dioxide during the entire LiquiSmoke test was determined to be 500 ppm. The OSHA Permissible Exposure Limit (PEL) is 5,000 ppm.

In addition, testing by Maxim Technologies was also performed to determine if usage of the product left any staining or odor. Residual staining and odor tests were conducted in a closed facility filled with LiquiSmoke. Time interval testing of filter paper samples exposed to LiquiSmoke were examined under a microscope at 40X magnification. In all cases, no visible staining was present, along with no odor on any of the filter papers exposed to the smoke.

This summary is based on complete reports from Maxim Technologies of Sioux Falls, South Dakota. Copies of these tests, as well as the findings of the Wisconsin Occupational Health Laboratory, are available from Hurco Technologies, Inc.



PLEASE NOTE: This information is for Hurco LiquiSmoke in LIQUID form ONLY. This does not pertain to the SMOKE form. Contact Hurco for that information.

SECTION 1 IDENTIFICATION

Product Identifier	Hydrotreated Middle Distillate
Trade Name	Hurco LiquiSmoke™
Chemical Formula	Proprietary
Use	This product is intended for use in Hurco Smoke Testing Equipment.
Manufacturer/Distributor	Hurco Technologies, Inc. 409 Enterprise Street Harrisburg, SD57032 605-743-2466 info@hurcotech.com
Emergency Phone	CHEMTREC - 800-424-9300

SECTION 2 HAZARD IDENTIFICATION

GHS Classification	Aspiration Hazard Category 1
Signal Word	DANGER!
Pictogram	
Hazard Statement	May be fatal if swallowed and enters airways.
Response	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Do NOT induce vomiting.

This product is considered hazardous under 29 CFR 1919.1200

Liquid

SDS

SAFETY DATA SHEET

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	Hydrotreated Middle Distillate
CAS #	64742-46-7
Percent	100

SECTION 4 FIRST AID MEASURES

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses. Get medical attention if irritation occurs.

Skin Contact: Remove contaminated clothing and shoes. Wash skin immediately and thoroughly with soap and water. Get medical attention if irritation develops. Wash clothing and shoes before reuse.

Inhalation: Move affected person to fresh air. Loosen tight clothing. If breathing is difficult, provide oxygen. If not breathing, provide artificial respiration. Get medical attention if adverse health symptoms persist or are severe.

Ingestion: Consult poison center/doctor immediately. Rinse mouth thoroughly if conscious. Do not induce vomiting. If vomiting occurs, keep head low so the vomit does not enter lungs.

Acute Exposure Effects	Ingestion may cause nausea, vomiting and diarrhea. May be fatal if swallowed and enters airway. May cause skin dryness or irritation.
Chronic Exposure Effects	Ingestion may cause nausea, vomiting and diarrhea. May cause skin dryness or irritation.
Physician Treatment	Treat symptomatically.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media	CO ₂ , Dry Chemical, Foam.
Unsuitable Extinguishing Media	Avoid solid water stream/jet which may spread fire.
Fire Fighting Procedures	Isolate scene. Wear appropriate protective equipment. SCBA may be required.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal Precautions	Eliminate all sources of ignition. Avoid walking through spilled product. Remove unnecessary personnel. Wear appropriate protective equipment when required.
Environmental Precautions	Prevent spilled material from entering sewers, drainage systems, waterways and soil. Contact proper authorities regarding possible contamination if necessary.
Containment and Cleanup	Contain with earthen like or petroleum absorbent material. Remove all contaminated materials to salvage container. Dispose of in accordance with local regulations. Smaller amounts of product may be diluted with water and mopped up.

SECTION 7 HANDLING AND STORAGE

Handling	Do not eat, drink or smoke while handling product or in product storage areas.
Storage	Keep away from ignition sources. Store in original container or a properly labeled approved alternative. Keep container upright and tightly closed.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Ingredient	Hydrotreated Middle Distillate
Exposure Limits	OSHA PEL: TWA 5 mg/m ³ (8 hours) ACGIH TLV: TWA 5 mg/m ³ (8 hours); STEL 10 mg/m ³ (15 minutes)
Appropriate Engineering Controls	General ventilation. Local exhaust to control vapors. Mechanical ventilation for confined spaces.
Personal Protective Equipment	Eye protection - Chemical goggles or face shield. Skin protection - PVC/equivalent glove. PVC/equivalent apron where splash potential exists.
Hygienic Practices	Minimize body contact. Wash body contact areas promptly. Wash contaminated clothing.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear to light yellow liquid
Odor	Negligible
Odor Threshold	Not available
pH	Not available
Melting Point	30 °F
Freezing Point	Not available
Boiling Point	470 °F
Flash Point	252 °F
Evaporation Rate	Not available
Flammability (Solid, Gas)	Not available
Upper/Lower Explosive Limits	Not available
Vapor Pressure	<0.1
Vapor Density	Not available
Relative Density	0.85
Solubility in Water	Insoluble
Partition Coefficient	Not available
Auto-ignition Temperature	Not available
Decomposition Temperature	Not available
Viscosity	3.6

SECTION 10 STABILITY AND REACTIVITY

Reactivity	Not known to be reactive under normal conditions.
Stability	Stable under normal conditions.
Hazardous Reactions	No hazardous reactions under normal conditions.
Materials to Avoid	Heat and flame
Incompatible Materials	Oxidizers and acids
Hazardous Decomposition	Carbon Monoxide and other petroleum decomposition products.

SECTION 11 TOXICOLOGICAL INFORMATION

Route of Exposure	Inhalation
Related Symptoms	None known
Acute and Chronic Effects	None known
Route of Exposure	Ingestion
Related Symptoms	Nausea or vomiting
Acute and Chronic Effects	May be fatal if swallowed and enters airway
Route of Exposure	Skin
Related Symptoms	May cause irritation or dryness
Acute and Chronic Effects	May cause irritation or dryness
Route of Exposure	Eye
Related Symptoms	None known
Acute and Chronic Effects	None known
Numerical measures of toxicity	Oral LD Rat - >5000 mg/kg. Dermal LD50 - >2000 mg/kg
Potential Carcinogen	No

SECTION 12 ECOLOGICAL INFORMATION

Ecotoxicity	Not Available
Persistence and Degradability	Not Available
Bioaccumulative Potential	Not Available
Mobility in Soil	Not Available
Other Adverse Effects	Not Available

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Management	Dispose of per Federal, State and local laws. Avoid generation of waste wherever possible.
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SECTION 14 TRANSPORT INFORMATION

Proper Shipping Name	Not a DOT regulated material
UN/NA Number	N/A
Hazard Class	N/A
Packaging Group	N/A
Environmental Hazards	No
Transport in Bulk	Packaging in excess of 3500 gal require an OIL SPILL perversion and response plan per 49 CFR1
Special Precautions	Transport upright in closed containers.

SECTION 15 REGULATORY INFORMATION

SARA Section 311	This product is may be subject to regulations under Section 311 of the Clean water Act and Oil Pollution Act. Release of this product into United States waters or adjoining shorelines must be reported to the National Response Center: 800-424-8802.
SARA Section 313	No components are listed
Fire Hazard	No
Sudden Release	No
Immediate	No
Reactive Hazard	No

SECTION 16 OTHER INFORMATION

Issue Date	01/01/18
NFPA 704M Rating	
Flammability	1
Health	1
Instability	0
Special Hazards	Blank



This SDS is for the unburnt LiquiSmoke ONLY.
Test data is available for LiquiSmoke "smoke"
by contacting Hurco Technologies.

Hurco Technologies, Inc.

409 Enterprise Street

Harrisburg, SD 57032

605-743-2466

info@hurcotech.com

HURCOTECH.COM

The information contained in this SDS is believed to be accurate, but is not warranted to be, whether originated with Hurco Technologies or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to the circumstances. All hazard precautions given in this SDS must be observed.

Superior® Smoke Generator

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 04/29/2015 Revision date: 04/29/2015 Supersedes: 01/18/2011

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier

Product form : Mixture
Trade name : Superior® Smoke Generator
CAS No : NA
Product code : NA

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Restricted to professional users

1.3. Details of the supplier of the safety data sheet

SUPERIOR SIGNAL COMPANY LLC
P.O. Box 96
Spotswood, NJ 08884
Phone: 732-251-0800
Fax: 732-251-9442
Email: info@superiorsignal.com

1.4. Emergency telephone number

Emergency number : 732-251-0800

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Carc. 1B H350

Full text of H-phrases: see section 16

NOTE: Exposure is highly unlikely when product is used as directed. Product is sealed in heavy cardboard tube or metal canister. After ignition, product slowly combusts and hexachloroethane is consumed. Direct contact with product does not occur.

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS08

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US)

H350 - May cause cancer (Dermal, oral)

Precautionary statements (GHS-US) :

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective clothing
P308+P313 - If exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/container to in accordance with local regulations

2.3. Other hazards

Other hazards not contributing to the classification

: After ignition, Smoke Generator emits smoke (mild Zinc Chloride solution) that can be irritating to the eyes, respiratory tract, and mucous membranes. When used as directed exposure should be limited, and normally poses no hazard. Persons with known respiratory sensitivity should not be exposed to smoke. Moderate exposure may temporarily result in irritation, inflammation, and difficulty breathing – moving to fresh air will reverse these effects. Heavy exposure may result in coughs, chills, fever, and pulmonary edema, requiring medical treatment. Overwhelming exposure can be dangerous and is to be avoided. Persons who will be exposed to sustained heavy smoke should wear Self Contained Breathing Apparatus (SCBA).

2.4. Unknown acute toxicity (GHS-US)

Not applicable

EN (English US)

Page 1

Candle SDS

Superior® Smoke Generator

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 3: Composition/Information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification (GHS-US)
Hexachloroethane	(CAS No) 67-72-1	30 - 55	Carc. 1B, H350

Full text of H-phrases: see section 16

Remaining product components are not considered hazardous.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation : Allow victim to breathe fresh air. Allow the victim to rest.
First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.
First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : May cause cancer.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry powder, Sand, Foam, Water spray.
Unsuitable extinguishing media : Do not use a heavy water stream. Do not use extinguishing media containing water.

5.2. Special hazards arising from the substance or mixture

Reactivity : May react with water, producing smoke.

5.3. Advice for firefighters

Firefighting instructions : Fight fire with normal precautions from a reasonable distance. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
Protection during firefighting : Self-contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.
Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : On land, sweep or shovel into suitable containers. Minimize generation of dust. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

EN (English US)

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Superior® Smoke Generator

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : After ignition, Smoke Generator emits smoke that can be irritating to the eyes, respiratory tract, and mucous membranes (mild Zinc Chloride solution). When used as directed exposure should be limited, and normally poses no hazard.
- Precautions for safe handling : Persons with known respiratory sensitivity should not be exposed to smoke. Moderate exposure may temporarily result in irritation, inflammation, and difficulty breathing – moving to fresh air will reverse these effects. Heavy exposure may result in coughs, chills, fever, and pulmonary edema, requiring medical treatment. Overwhelming exposure can be dangerous and is to be avoided. Persons who will be exposed to sustained heavy smoke should wear Self Contained Breathing Apparatus (SCBA). Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
- Safe use of the product : Generate smoke to obscure, signal, trace airflow, or for other visual effects.
- Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from ignition sources. Keep only in original container. Store in a dry place. Store in original container. Prevent moisture contact. Keep only in the original container in a cool, well ventilated place away from ignition sources. Keep container closed when not in use.
- Incompatible products : Strong bases. Strong acids.
- Incompatible materials : Mixture may be water reactive, releasing smoke (mild zinc chloride solution). Sources of ignition.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Superior® Smoke Generator (NA)		
ACGIH		Not applicable
OSHA		Not applicable
Hexachloroethane (67-72-1)		
ACGIH	ACGIH TWA (ppm)	1 ppm
OSHA	OSHA PEL (TWA) (mg/m ³)	10 mg/m ³
OSHA	OSHA PEL (TWA) (ppm)	1 ppm

8.2. Exposure controls

- Personal protective equipment : Avoid all unnecessary exposure.
- Hand protection : Wear protective gloves.
- Eye protection : Chemical goggles or safety glasses.
- Respiratory protection : Wear appropriate mask.
- Other information : Do not eat, drink or smoke during use. NOTE: Exposure is highly unlikely when product is used as directed. Product is sealed in heavy cardboard tube or metal canister. After ignition, product slowly combusts and hexachloroethane is consumed. Direct contact with product does not occur.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Solid
- Appearance : Powder contained in sealed tube or canister.
- Color : Gray
- Odor : Mothballs
- Odor threshold : No data available
- pH : No data available

EN (English US)

3/7

Superior® Smoke Generator

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

- Melting point : No data available
- Freezing point : No data available
- Boiling point : No data available
- Flash point : No data available
- Relative evaporation rate (butyl acetate=1) : No data available
- Flammability (solid, gas) : No data available
- Explosion limits : No data available
- Explosive properties : No data available
- Oxidizing properties : No data available
- Vapor pressure : No data available
- Relative density : No data available
- Relative vapor density at 20 °C : No data available
- Solubility : No data available
- Log Pow : No data available
- Log Kow : No data available
- Auto-ignition temperature : No data available
- Decomposition temperature : No data available
- Viscosity : No data available
- Viscosity, kinematic : No data available
- Viscosity, dynamic : No data available

9.2. Other information

- Minimum ignition energy : *

SECTION 10: Stability and reactivity

10.1. Reactivity

May react with water, producing smoke.

10.2. Chemical stability

Product is stable. Not established.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Moisture. High temperature. High humidity.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

zinc chloride. Smokes. Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

- Acute toxicity : Not classified

Hexachloroethane (67-72-1)	
LD50 oral rat	4460 mg/kg
LD50 dermal rabbit	32000 mg/kg
ATE US (oral)	4460.000 mg/kg body weight
ATE US (dermal)	32000.000 mg/kg body weight
Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: May cause cancer (Dermal, oral).

EN (English US)

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Superior® Smoke Generator

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Hexachloroethane (67-72-1)	
IARC group	2B - Possibly carcinogenic to humans
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity, 3 - Reasonably anticipated to be Human Carcinogen
In OSHA Hazard Communication Carcinogen list	Yes
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

Hexachloroethane (67-72-1)	
LC50 fish 1	967 - 1250 µg/l (Exposure time: 96 h - Species: Pimephales promelas)
LC50 fish 2	712 - 1030 µg/l (Exposure time: 96 h - Species: Lepomis macrochirus)

12.2. Persistence and degradability

Superior® Smoke Generator (NA)	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

Superior® Smoke Generator (NA)	
Bioaccumulative potential	Not established.
Hexachloroethane (67-72-1)	
Log Pow	4.14

12.4. Mobility in soil

Superior® Smoke Generator (NA)	
Ecology - soil	None.

12.5. Other adverse effects

Effect on the global warming	: No known ecological damage caused by this product.
Other information	: Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to ...
Ecology - waste materials	: Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Not regulated for transport

Additional information

Other information	: No supplementary information available.
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ADR

No additional information available

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Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Hexachloroethane (67-72-1)	
SARA Section 313 - Emission Reporting	0.1 %
Zinc (7440-66-6)	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 313 - Emission Reporting	1.0 % (dust or fume only)

15.2. International regulations

CANADA

All components listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

All components listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Classification according to Regulation (EC) No. 1272/2008 [CLP]

No additional information available

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

Not classified

National regulations

All components listed on the AICS (Australian Inventory of Chemical Substances)
All components listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
All components listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
All components listed on the Korean ECL (Existing Chemicals List)
All components listed on NZIoC (New Zealand Inventory of Chemicals)
All components listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
All components listed on INSQ (Mexican national Inventory of Chemical Substances)

15.3. US State regulations

Hexachloroethane (67-72-1)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes	No	No	No	20 µg/day

Hexachloroethane (67-72-1)				
U.S. - Massachusetts - Right To Know List				
U.S. - New Jersey - Right to Know Hazardous Substance List				
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				
U.S. - Pennsylvania - RTK (Right to Know) List				
Zinc (7440-66-6)				
U.S. - Massachusetts - Right To Know List				
U.S. - New Jersey - Right to Know Hazardous Substance List				
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				
U.S. - Pennsylvania - RTK (Right to Know) List				

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Zinc oxide (1314-13-2)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Full text of H-phrases:

Carc. 1B	Carcinogenicity Category 1B
H350	May cause cancer

Revision date : 04/29/2015

Other information : **DISCLAIMER OF LIABILITY** The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

How to Begin Smoke Testing

NOTICE

SMOKE TESTING SEWER LINES

ORWA is conducting a smoke test of
It's sanitary sewer system.

Work crews will be in your area starting July 19th and a rain out date on the 20th. A "Smoke test" survey will assist the inspection crews in locating breaks and defects in the sewer system.

The smoke should not enter your home unless you have a defect in your homes plumbing system or you have drain traps that are dried-up.

It is advisable for the homeowner to pour a gallon of water into any unused bathroom fixture and each floor drain prior to the testing date. If smoke does enter your home, there is a strong reason to assume that dangerous sewer gases are entering your home or business. You should evacuate the building immediately and notify the work crew. If you are not at home at the time of testing and return home to find smoke, please call John Heil at (740) 502-3665

IMPORTANT! If there is any individual in your home or business that has respiratory problems and is immobile, please notify us at (740) 502-3665 prior to the testing date.

NOTICE

Sewer Smoke Testing

Work crews will be conducting a Smoke Test of the sanitary sewer system in this area on:

The purpose of a smoke test is to locate breaks, defects, and plumbing faults in the sewer system.

During the smoke test you may see smoke coming from building vent stacks, holes in the ground, or other locations. Do not be alarmed and do not call the Police or the Fire Department unless you are sure there is a true emergency.

The smoke is:

- NON-Toxic
- White / Gray in color
- Leaves no residue
- Does not pose a fire hazard

Smoke should not enter your home during the smoke test unless you have defective plumbing or dry drain traps.

See Important Information

On Back 

Prior to testing date, pour 1/2 gallon of water in every basement floor drain and any seldom used sink/shower drains. Also flush any seldom used toilets.

If smoke enters your home this indicates that **DANGEROUS SEWER GAS** could be regularly entering your home.

If this happens:

1. Note the source of the smoke
2. Open several windows for ventilation
3. Remove people and pets from building until smoke has cleared
4. Immediately notify test crew or call number below if you cannot locate a test crew

IMPORTANT

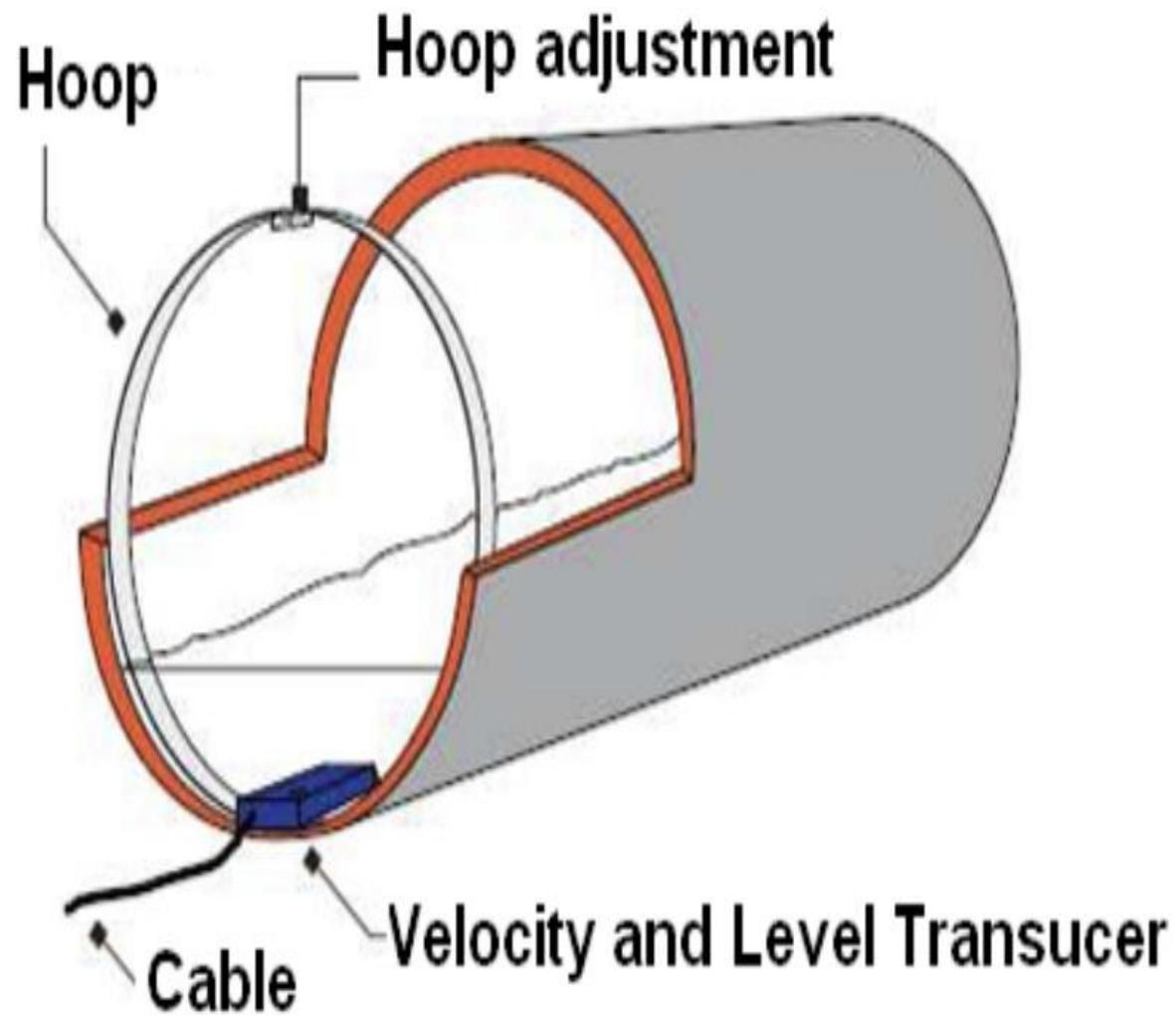
If there are any of the following in your building please contact us before the smoke test:

- Individuals with respiratory problems
- Individuals who are immobile
- Pets who are confined and unattended

Contact Information:

Scan for
Important
Information:





No	Location	Date	PE	Peak flows l/s	Average flows l/s	Actual peak flow factor	Constant value of peak flow Factor, K	Flow per capita l/day/person
1	T.Sri Pulai (MH11)	30/6-3/7/05	1705	6.00	2.41	2.49	2.64	122.13
2	T.Sri Pulai (MH11)	6-9/8/05	1705	4.50	2.13	2.11	2.24	107.94
3	T.Sri Pulai (MH11)	27-31/8/05	1705	5.83	2.60	2.24	2.38	131.75
4	T.Sri Pulai (MH11)	6-10/9/05	1705	6.58	3.00	2.19	2.33	152.02
5	T.Sri Pulai (MH11)	17-20/1/06	1705	8.47	3.84	2.21	2.34	194.59
6	T.Universiti (MH299)	22-27/9/05	3456	7.30	3.54	2.06	2.36	88.50
7	T.Universiti (MH299)	1-6/10/05	3456	8.52	4.85	1.76	2.01	121.25
8	T.Universiti (MH299)	13-20/6/06	3456	4.97	2.43	2.05	2.34	60.75
9	T.Universiti (MH306)	13-20/6/06	3456	6.39	2.64	2.42	2.77	66.00
10	T.Universiti (MH154)	9-12/12/05	9905	13.83	9.47	1.46	1.88	82.61
11	T.Universiti (MH154)	30/12/05-2/1/06	9905	16.40	9.46	1.73	2.23	82.52
12	T.Universiti (MH154)	17-24/5/06	9905	21.56	10.80	2.00	2.57	94.21
13	T.Universiti (MH154a)	17-24/5/06	9905	25.00	10.96	2.28	2.94	95.60
14	T.Universiti (MH154)	11-18/10/06	9905	25.64	6.78	3.78	4.87	59.14
15	T.Universiti (MH154a)	11-18/10/06	9905	25.1	8.93	2.81	3.62	77.90
16	T.Universiti (MH154)	18-25/12/06	9905	29.74	15.06	1.97	2.54	131.37
17	T.Universiti (MH154a)	18-25/12/06	9905	47.26	26.83	1.76	2.27	234.03
18*	Putrajaya (PS-1)	11/05-1/06	10743	82.78	58.62	1.41	1.83	471.45
19*	Putrajaya (PS-2)	11/05-1/06	19869	205.83	172.02	1.20	1.66	748.03
20*	Putrajaya (PS-3)	11/05-1/06	20469	253.89	229.86	1.10	1.54	970.24
21*	Putrajaya (PS-10)	11/05-1/06	51463	527.78	417.57	1.26	1.95	701.05
22*	Putrajaya (PS-5)	11/05-1/06	80591	747.42	692.11	1.08	1.75	742.00



Studies

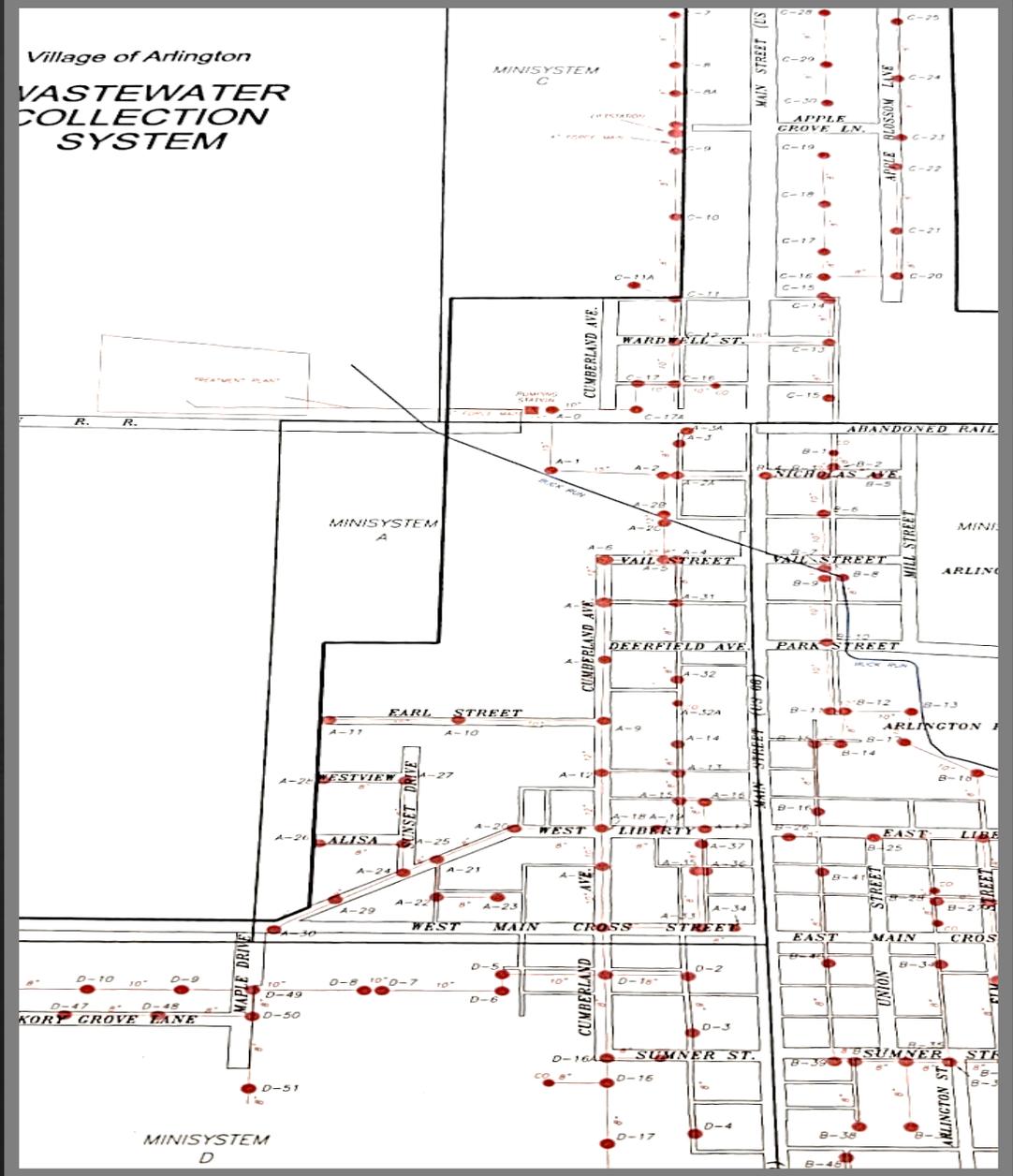
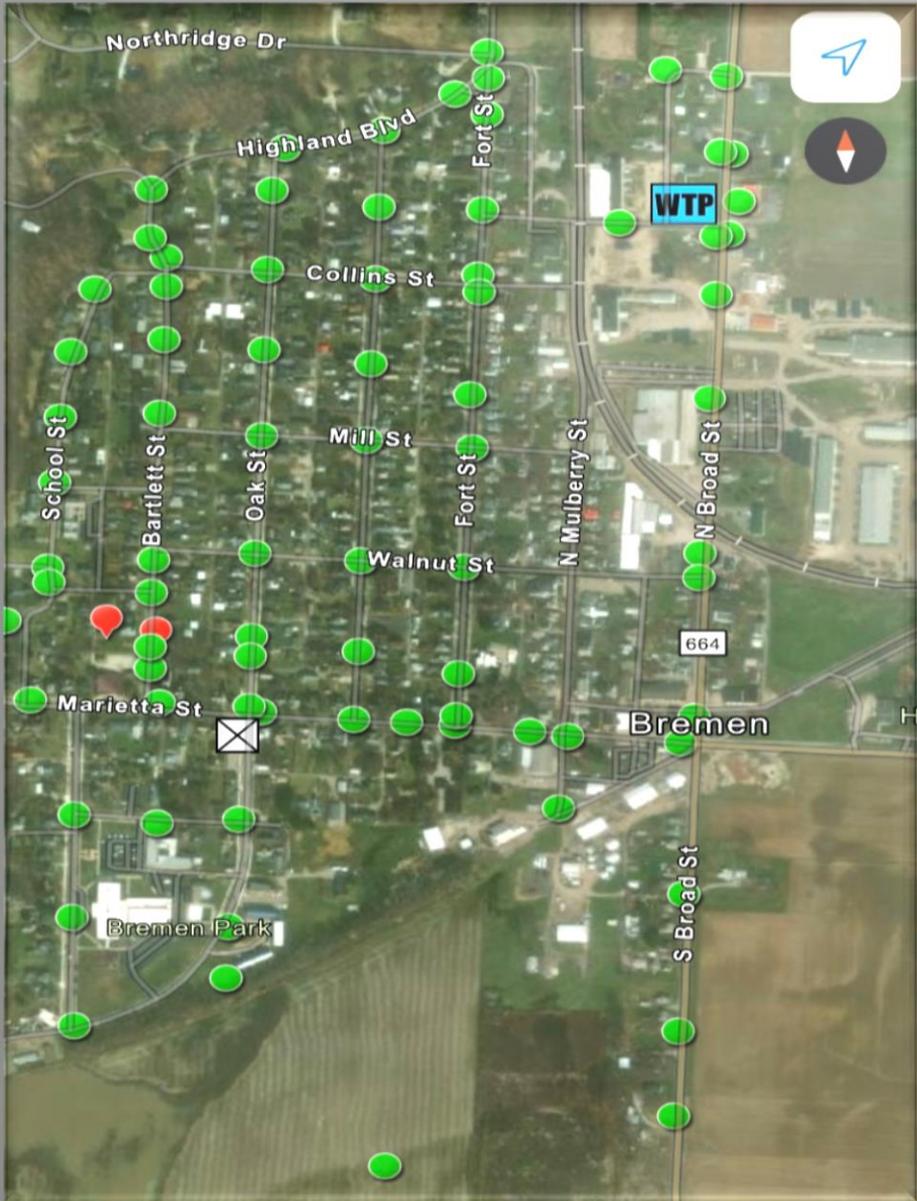
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	Woodville Flows ↗	5/16/2022, 8:28:46 PM	
	Wilmot ↗	4/12/2022, 11:08:03 AM	



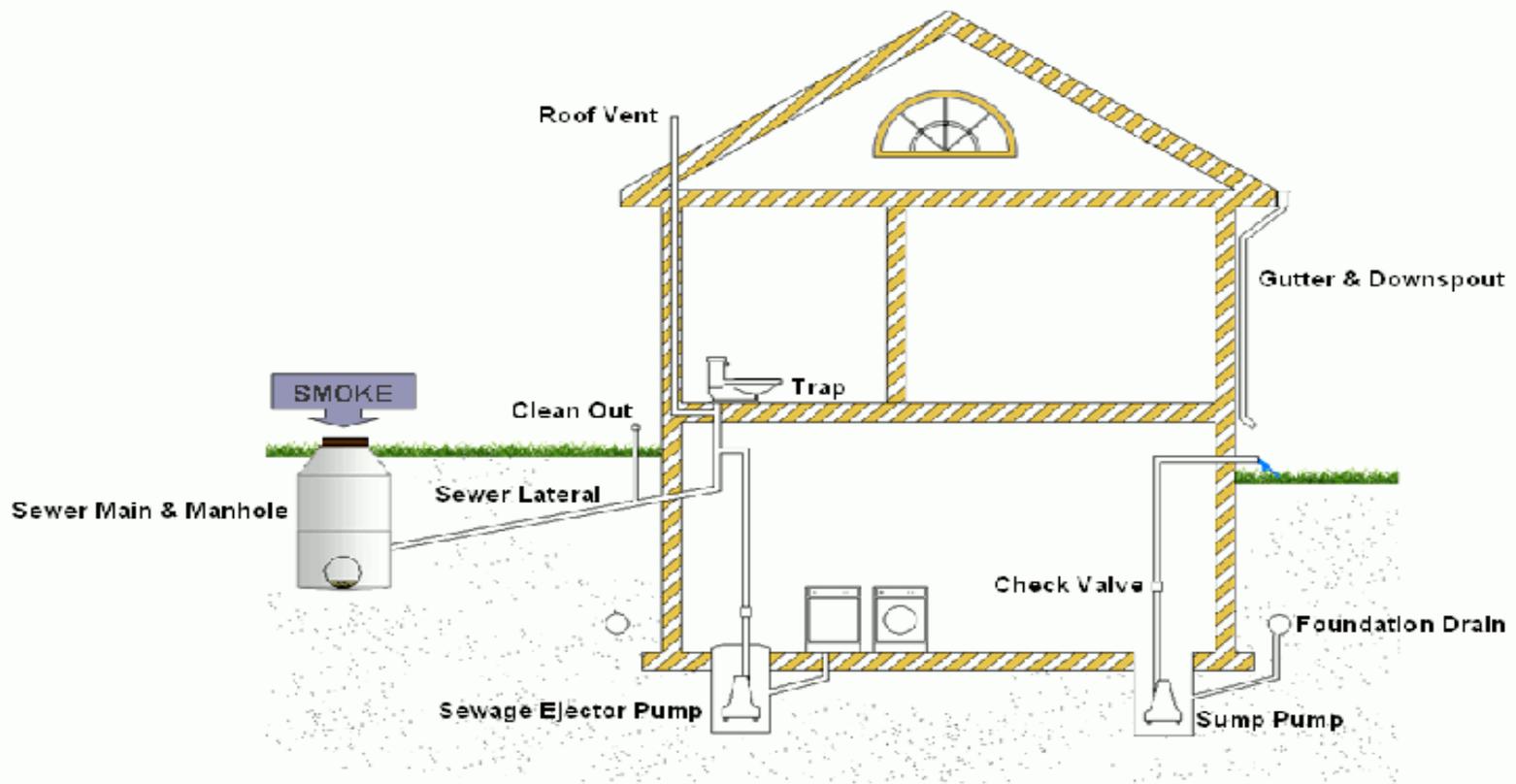
- I&I Findings
- Low
- Moderate
- High

GIS

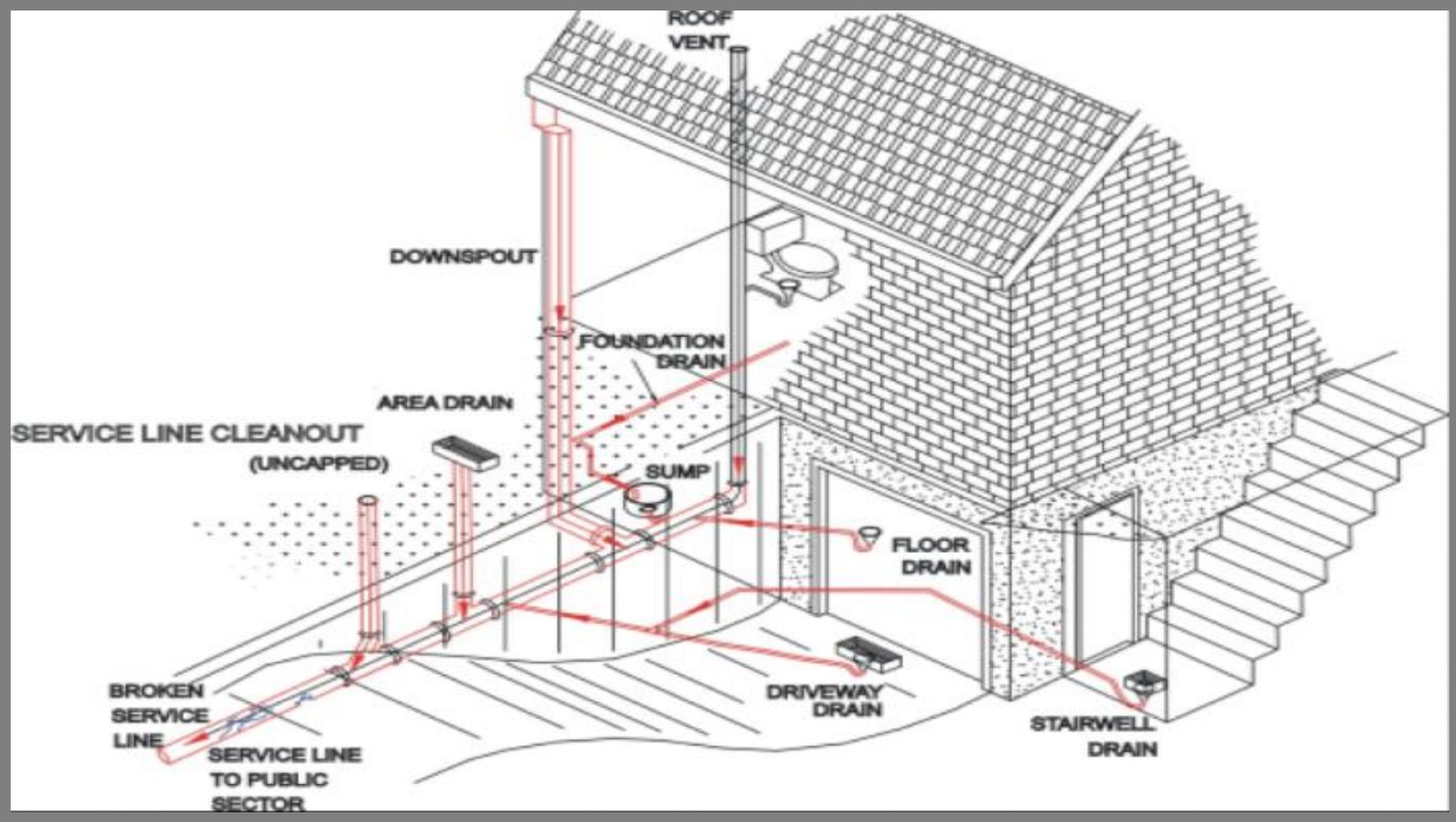


Traditional Map





















I&I Findings





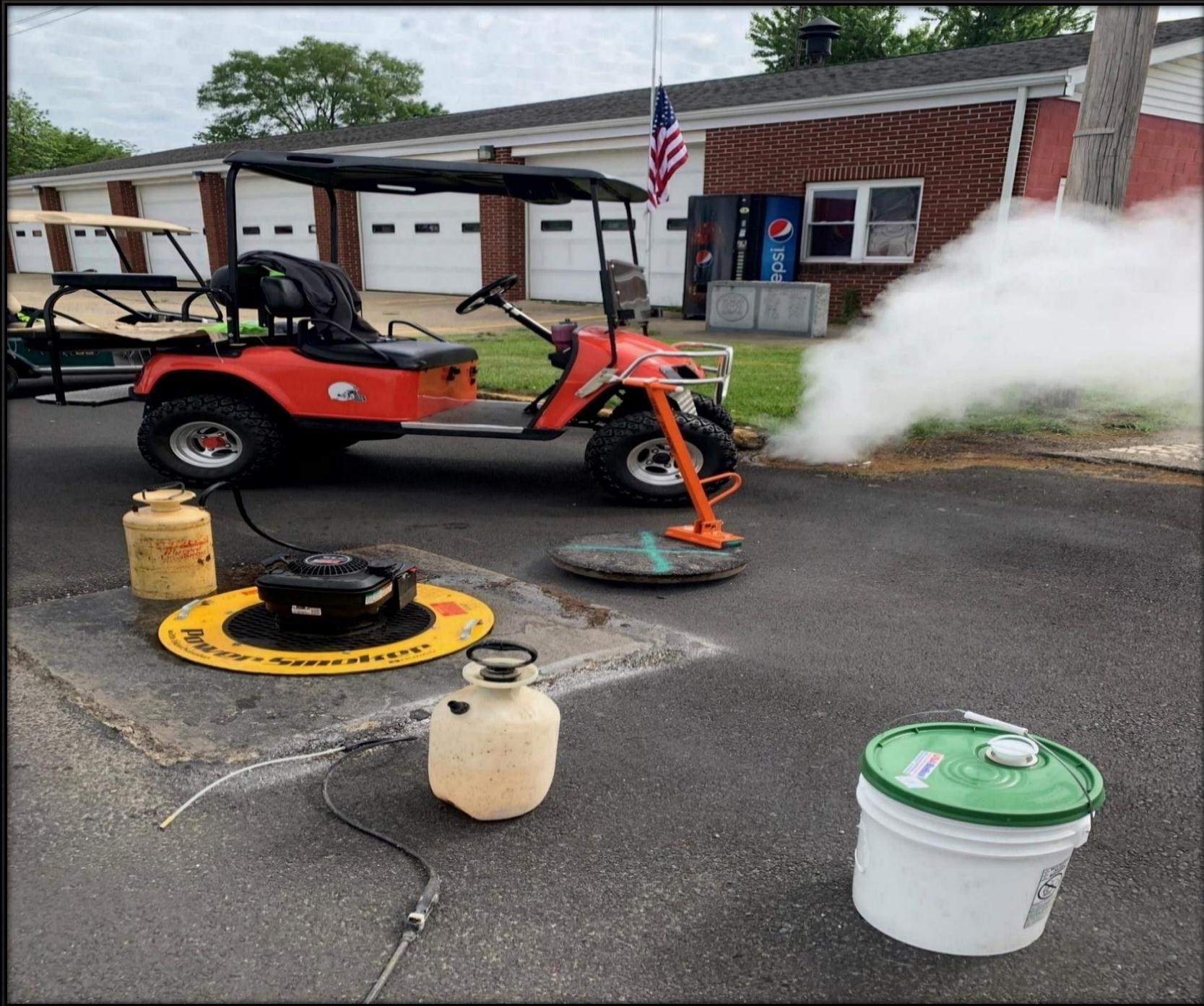










































Reporting Incidents

GIS vs Paper

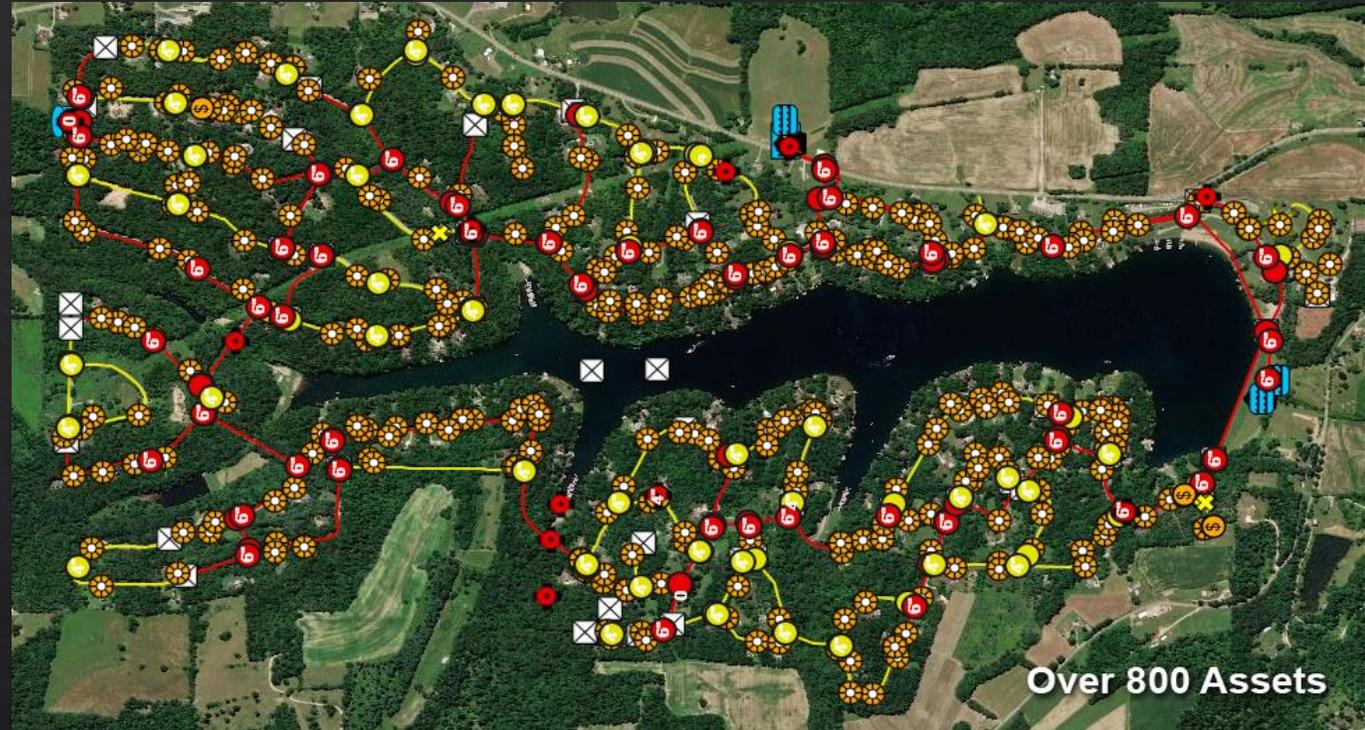
GIS Map

Over 70
Systems currently utilizing our
Custom Map Template

A Custom GIS Map Template for Small Water Systems

The template has 18 different asset types.

- Cloud Based
- Work Logs
- Nested Inventory
- Attach Photos, Videos, Excel Documents, etc.
- Track Smoke Incidents
- Operators can Add, Edit, Delete assets any time

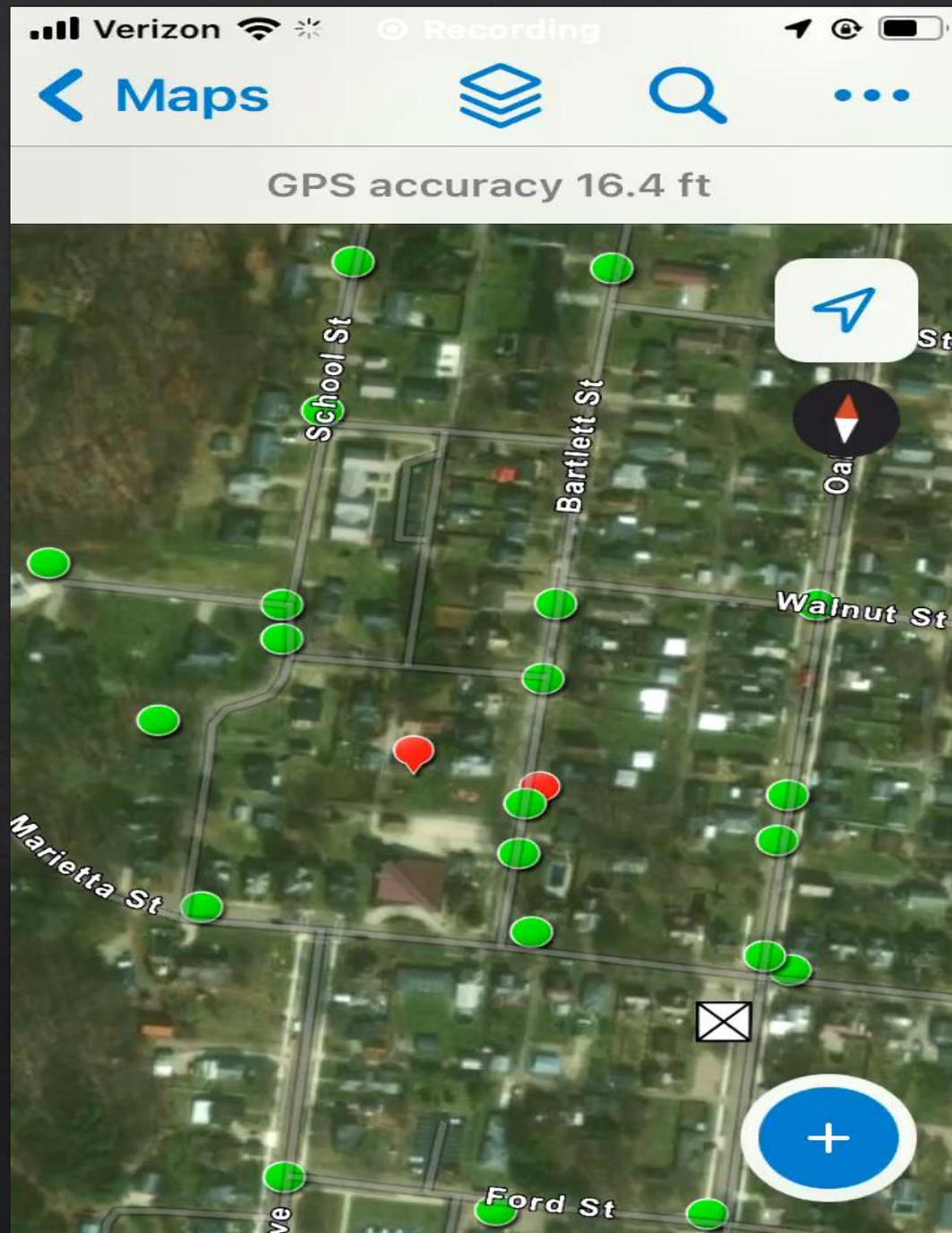




Collecting GIS Points



GIS



SMOKE TESTING INCIDENTS

DATE: _____

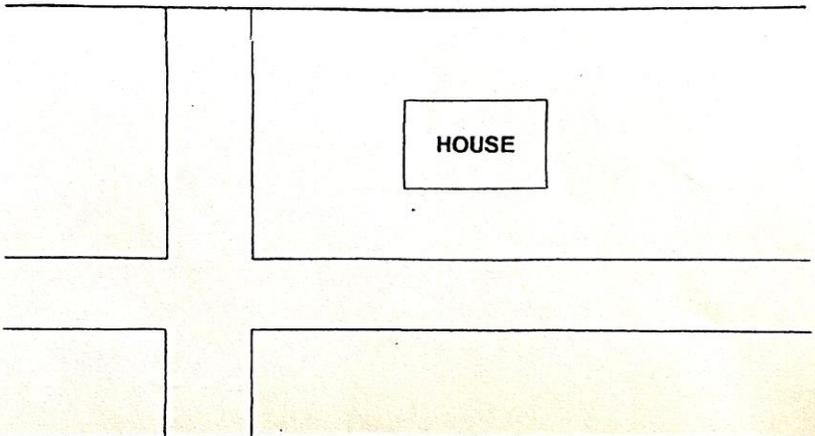
LINE SIZE _____ Subbasin: _____

FOOTAGE _____ TEST # _____

LOCATION: _____ TEST MH# _____

TO _____

HOUSE ADDRESS _____ CATCH BASIN ADDRESS: _____



Downspout (DS)	Yard Drain (YD)	Abandoned Downspout (DS-AB)	Clean Out (CO)	Area Drain (AD)	Driveway Drain (DD)	Ground Smoke (GS)	Catch Basin (CB)
_____	_____	_____	_____	_____	_____	_____	_____

NOTES:

Paper

SMOKE TESTING INCIDENTS

DATE: _____

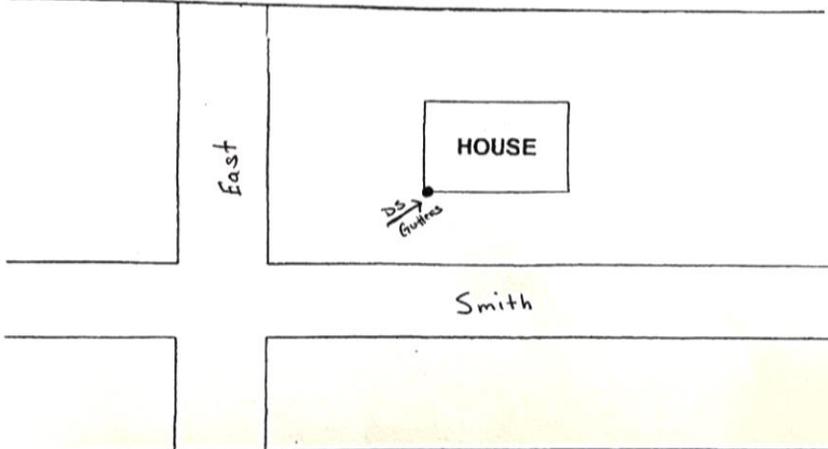
LINE SIZE: _____ Subbasin: _____

FOOTAGE: _____ TEST #: _____

LOCATION: _____ TEST MH#: _____

TO: _____

HOUSE ADDRESS 34 Smith Ave CATCH BASIN ADDRESS _____



Downspout (DS)	Yard Drain (YD)	Abandoned Downspout (DS-AB)	Clean Out (CO)	Area Drain (AD)	Driveway Drain (DD)	Ground Smoke (GS)	Catch Basin (CB)
X							

NOTES:



Investigation of Smoke Incidents

- ◆ Tractor Driven Camera

 - ◆ Push Camera

 - ◆ Dye Testing

Tractor Camera

1,000 feet cable

Pipe sizes from 6 inch

360 View of pipe

Ability to save an entire
Project (pics and videos)



Sewer Push Camera

Pipe sizes from 4 to 12 inch

300 Feet of cable

Ability to take pictures and
Record videos



Sewer Dye

Liquid



Tablet



571



568

571

2022-09-2108-25_0001.jpeg



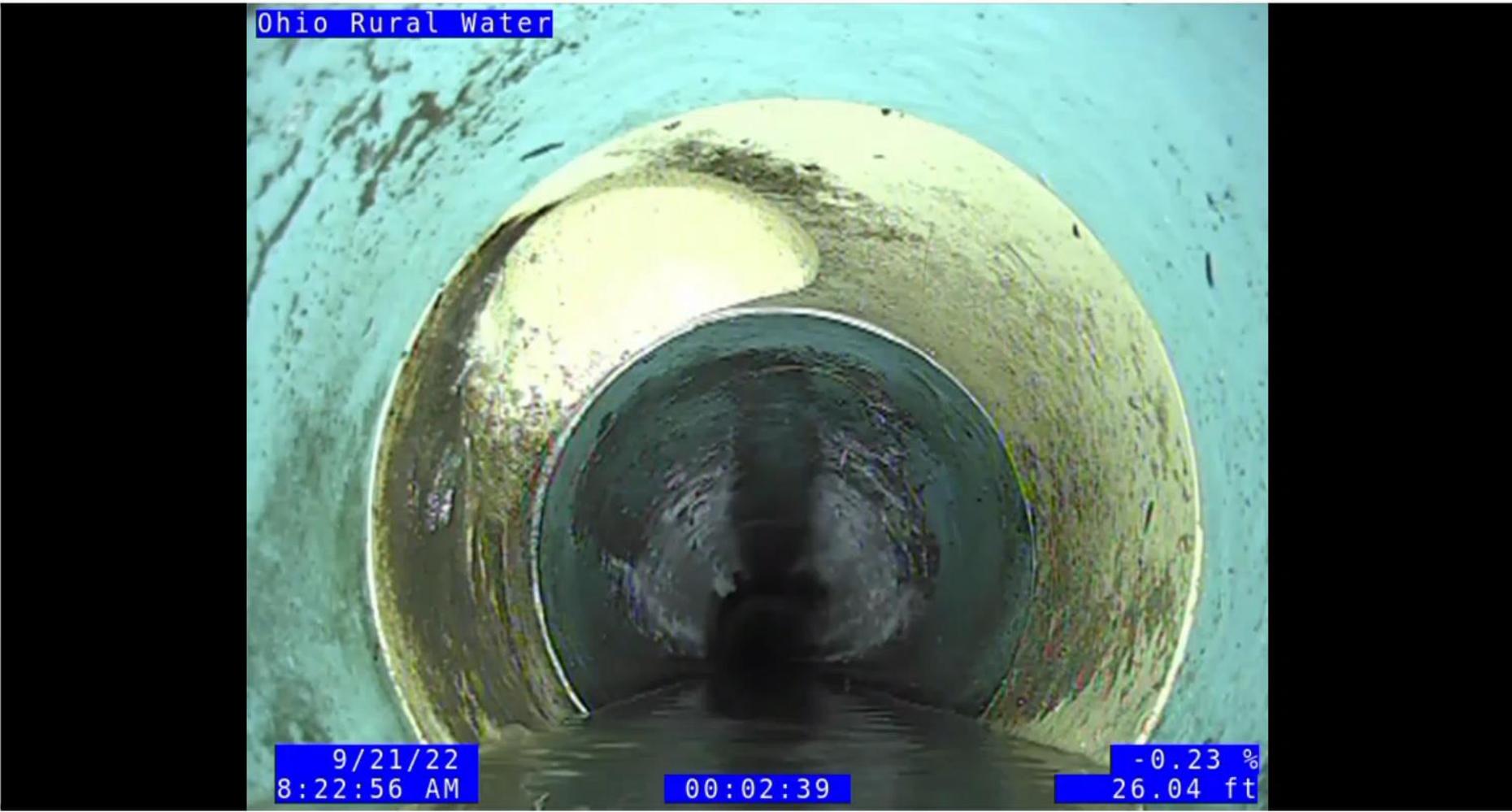
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Player Type: GStreamer



568



2022-09-2109-05_0001.mp4



2022-09-2109-38_0001.jpeg



2022-09-2109-37_0001.mp4



Questions?



Thank You!



**55 Whites Road
Zanesville, Ohio 43701**

740-455-3911

ohioruralwater.org