USDA FOG ABATEMENT TRAINING:

BUILDING A BUSINESS CASE FOR AN EFFECTIVE FOG ABATEMENT PROGRAM

SESSION 1

POLLUTION PREVENTION resource center

pprc

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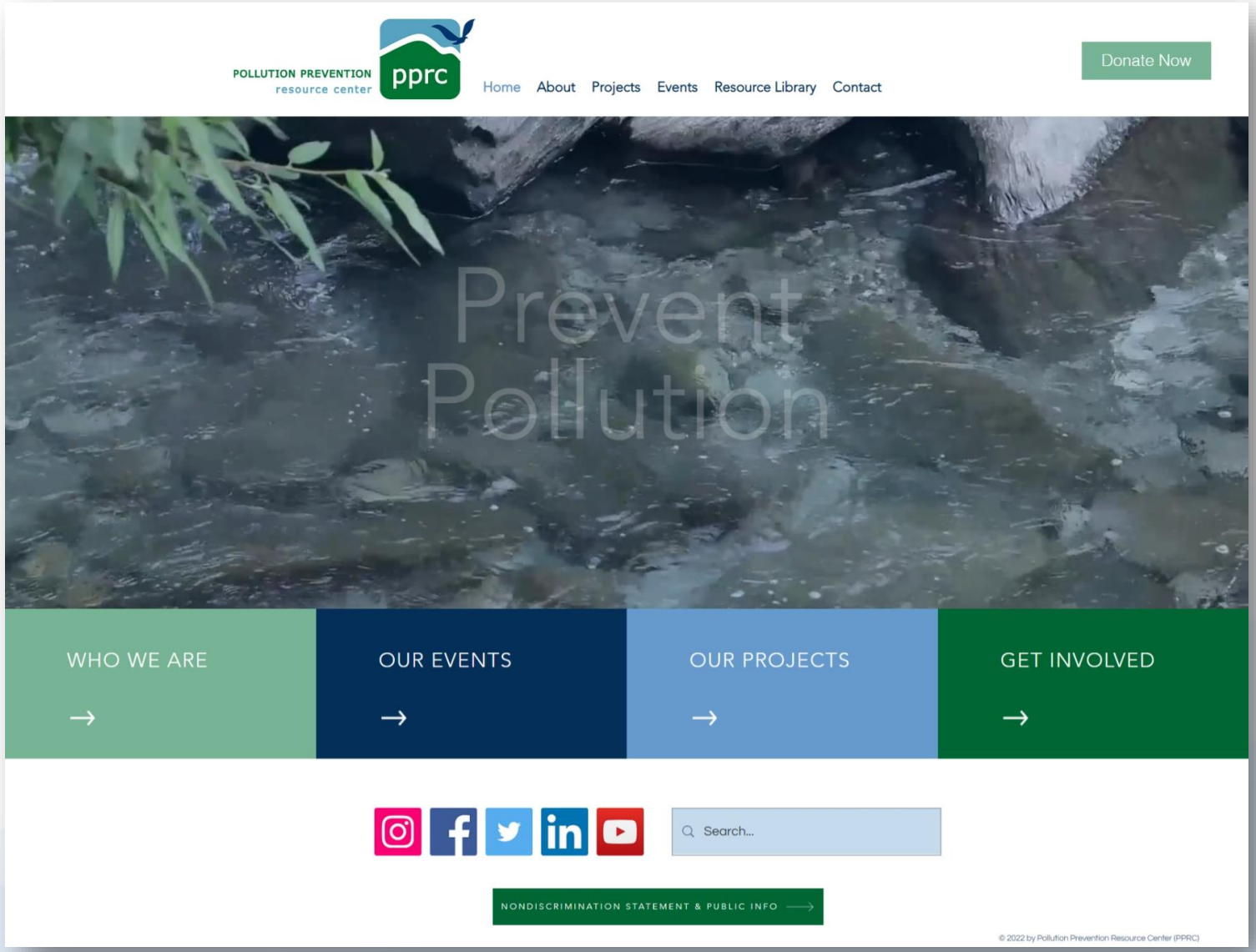

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TECHNICAL RESOURCES TAB

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TECHNICAL RESOURCES

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PRESENTATION TEAM MEMBERS & PEER REVIEWERS

Clayton Brown	Pollution Prevention Resource Center
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Michael O'dwyer	Oregon ACWA
Lauren Huey	AZ-FOG
Ken Loucks	APWA Pre-FOG
Jill Hoyenga	R8PA
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David James	
John Harland	
Jean Waters	
Jude Brown	

We encourage open discussion during the presentation…

TRAINERS:

Clayton Brown

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Patrick Bryan

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Ed Gilmore

Ken Grimm

David James

Jean Waters

BUSINESS CASE TOPICS

Session 1

- **Establishing the Need for a FOG Program**
- **Data Needed**
- **Excess Operation & Maintenance Costs**
- **Program Development Costs (Part 1)**

Session 2

- Planning
- Program Development Costs (Part 2)
- Data Acquisition and Management
- Cost-Benefit Analysis

Ed Gilmore

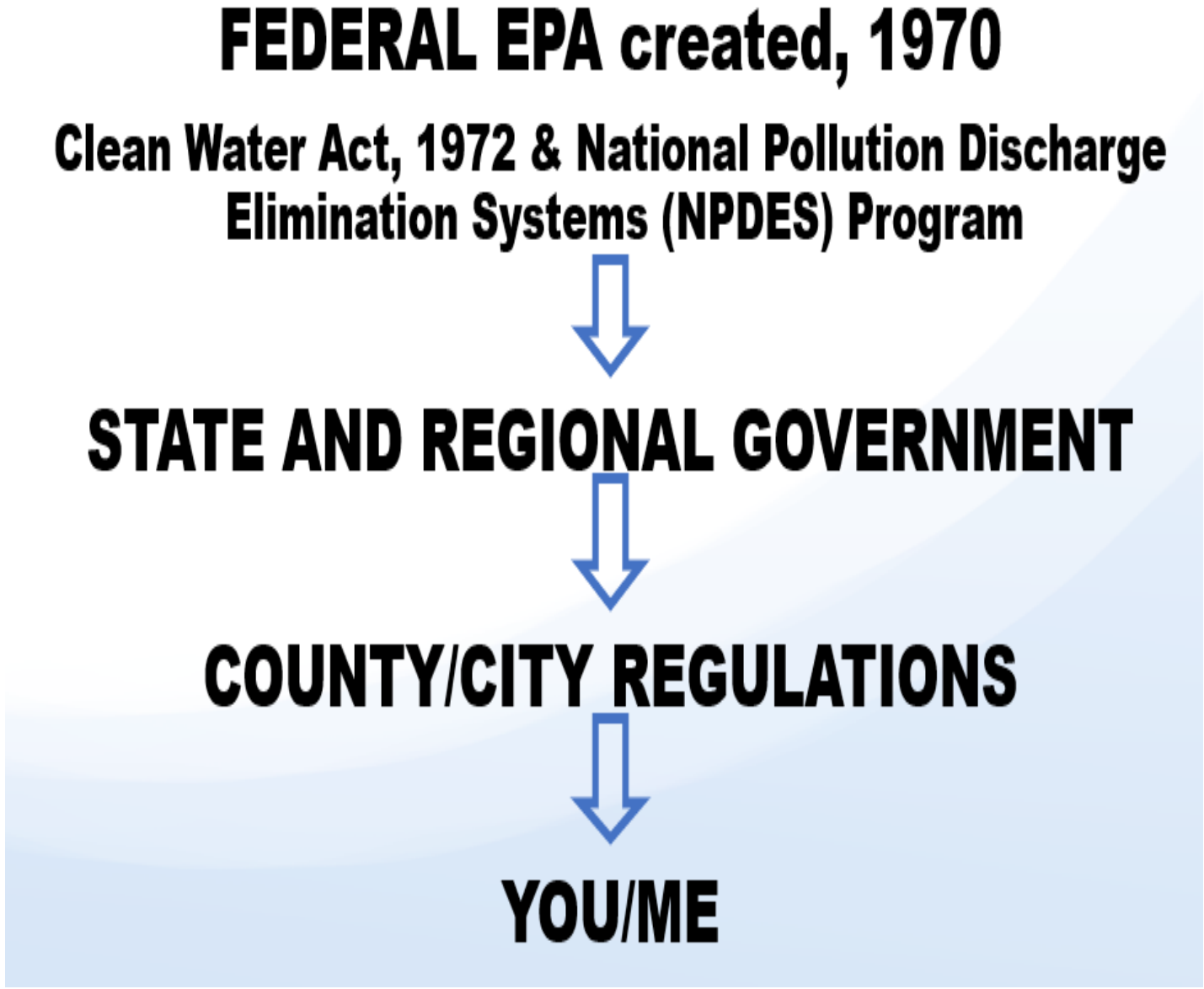
11 years Restaurant Owner

20 years, Source Control Specialist, Clackamas County, Oregon
Industrial Pretreatment, FOG, P2 and Septage programs

Currently Trainer, Western States Alliance, PPRC

Bachelor of Science, Biochemistry, Portland State University

Clean Water Act



ESTABLISHING THE NEED FOR A FOG PROGRAM

Why are we talking about FOG?

What are the regulatory & health drivers and problems & costs that drive the decision to establish or enhance a FOG program?

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Poll Question

Why are we talking about FOG?

- **WHAT IS FATS, OILS, & GREASE (FOG)?**
- **WHY FOG IS A CONCERN/ISSUE**
- **FOG IS A PROHIBITED DISCHARGE**
- **FOG CAN RESULT IN PROHIBITED SEWER OVERFLOWS & ENFORCEMENT**
- **FOG COSTS CITIES ALOT OF MONEY TO CONTROL**

FOG Characteristics

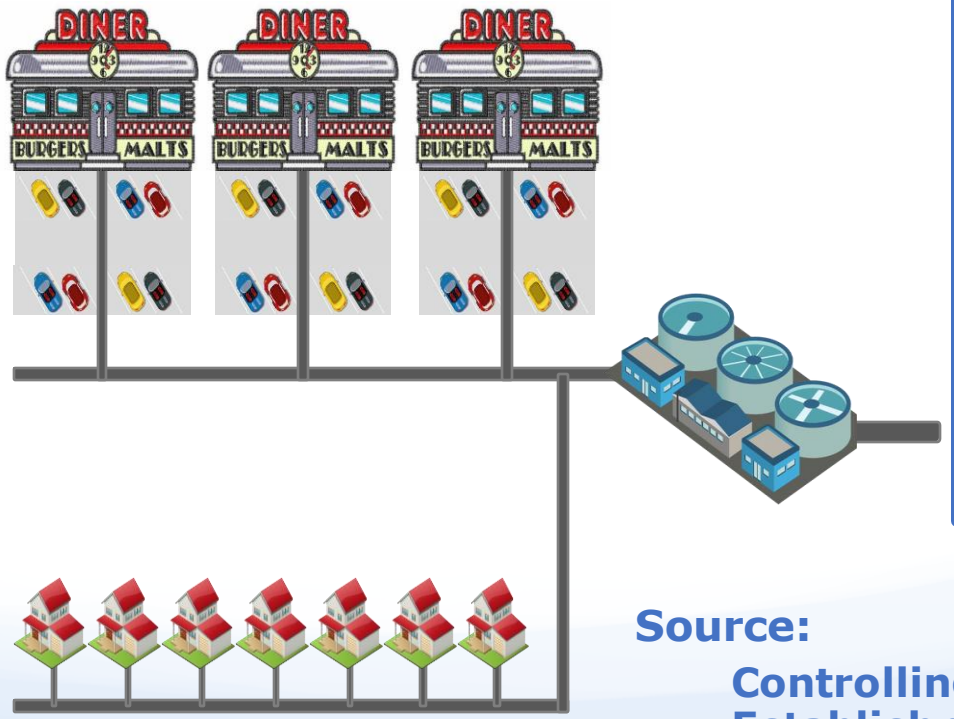
Yellow Grease vs Brown Grease

- Yellow grease from fryers, recovered from grease recovery devices. It can be recycled/reused
- Brown grease is the material removed from grease traps and interceptors

Grease is either "Polar" or "Non-Polar"

- Polar: animal or vegetable origin
- Non-Polar: petroleum or mineral origin

FSE FOG Production



"The annual production of collected grease trap waste and uncollected grease entering sewage treatment plants can be significant and ranges from 800 to 17,000 pounds/year per restaurant."

Source:

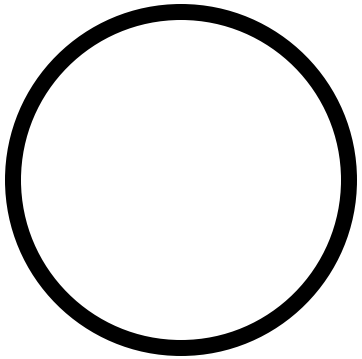
Controlling Fats, Oils, and Grease Discharges from Food Service Establishments

National Pretreatment Program, Office of Water, EPA-833-F-12-003, September 2012

FOG Accumulation Reduces Pipe Capacity

Gravity flow, low pressure, 2 ft/s

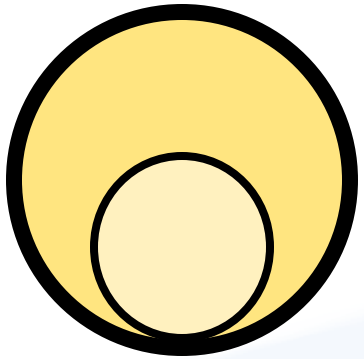
New Condition



4 Inches

78 GPM

Critical Stage

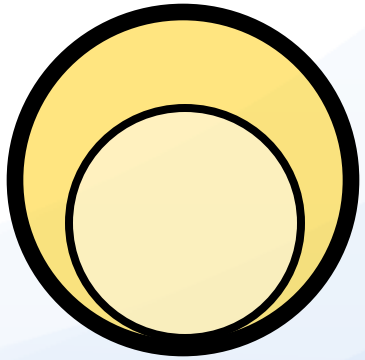


2 Inches

44 GPM

~ 45 % Reduction in Flow

Failure Stage



3 Inches

20 GPM

~ 75 % Reduction in Flow

Need for a FOG Program

FOG IS A PROHIBITED DISCHARGE

Causes illegal sanitary sewer overflows (SSOs)

- Human and Environmental Health
- Regulatory Compliance

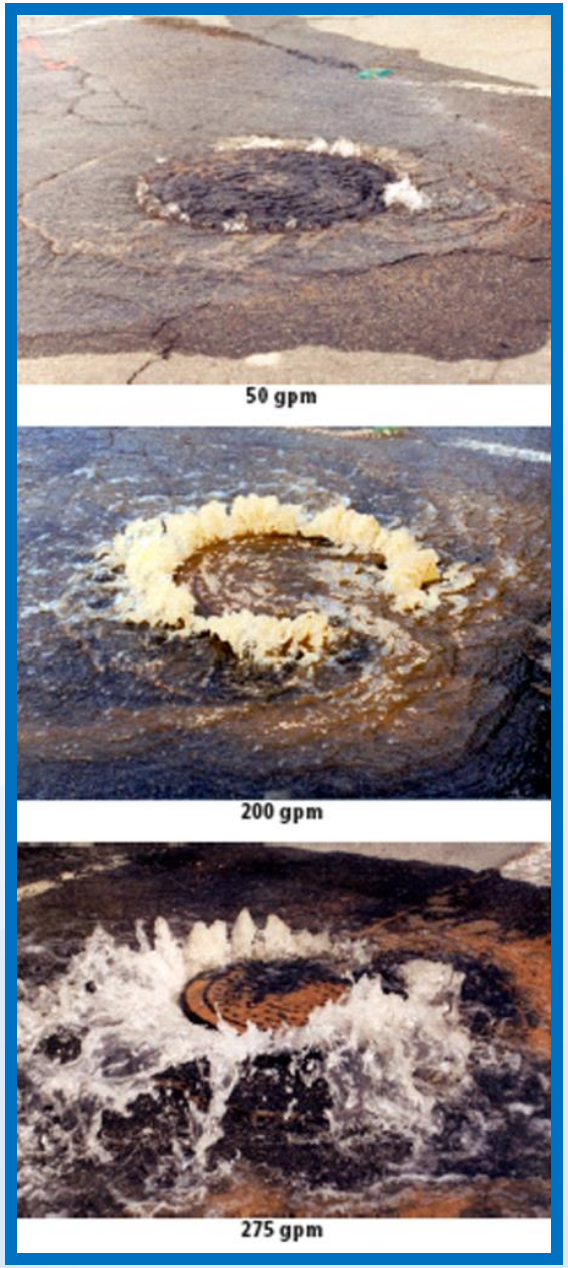
FOG COSTS UTILITIES A LOT OF MONEY

Increased Maintenance and Operational Cost

- Collection System Cleaning
- Pump Stations
- Additives
- Treatment Plants
- Treatment Capacity

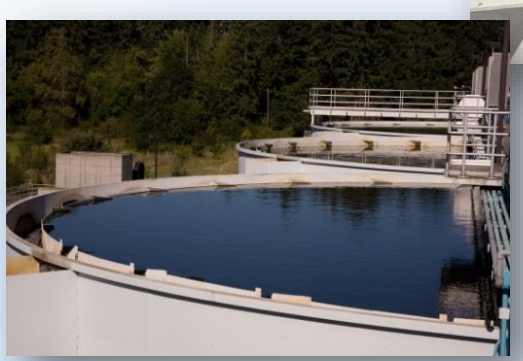
Regulatory Drivers

- EPA Prohibits SSOs
- EPA Enforcement Priority
- Federal Pretreatment Program Prohibits FOG Interference with Public Sanitary Sewer System
- NPDES Permits
  - Prohibits SSOs
  - Requires Proper Management of Sanitary Collection System



Infrastructure Drivers - Operation & Maintenance Costs

- Blockages and Overflows
- Maintenance
  - Collection System
  - Pump Stations, Air Relief Valves
  - Treatment Plants
- Infrastructure Damage
- Treatment Plant Operation
- Treatment Capacity



WHAT IS IMPORTANT TO YOUR CITY LEADERS?

- **Excess costs for FOG maintenance?**
- **Asset management?**
- **Care about small businesses?**
- **Reputation of the City or Sewer District?**
- **Customer complaints?**
- **Third-party lawsuits?**
- **State and Federal enforcement?**

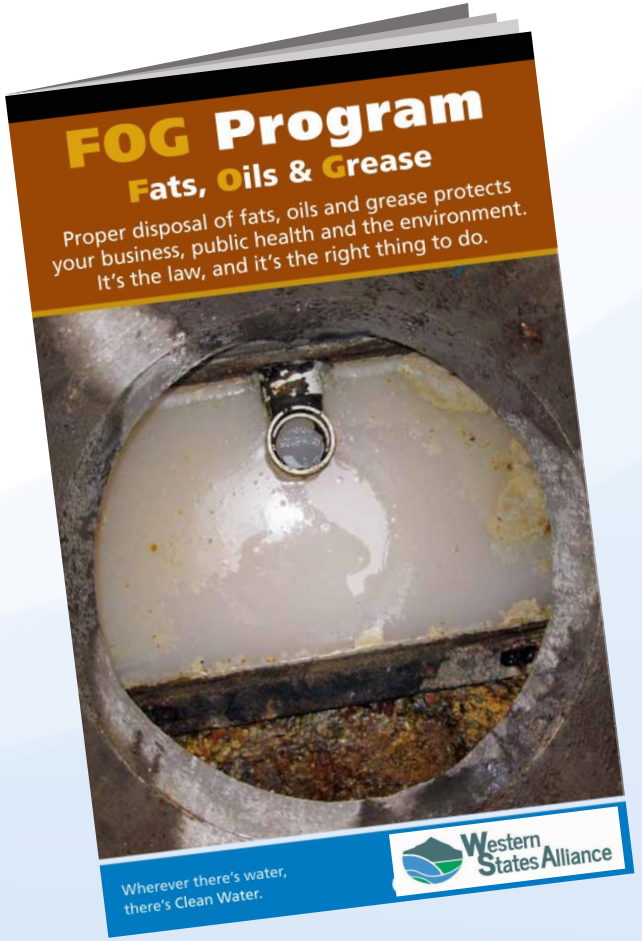
What is Capacity, Management, Operations & Maintenance (CMOM)?

- **Voluntary or Mandatory**
- **EPA believes CMOM should be considered by most utilities**
- **A framework for municipalities to identify and incorporate practices to:**
  - **Better manage, operate, and maintain collection systems.**
  - **Investigate capacity and constrained areas of the collection system.**
  - **Respond to sanitary sewer overflow (SSO) events**

https://www3.epa.gov/npdes/pubs/pretreatment_foodservice_fs.pdf

What Are Our Desired FOG Program Outcomes?

- Protect public health and the environment
- Cost effective, data driven program
- Comply with State and Federal Regulations



- Please complete the needs and demographic survey form
- Aggregate information is required by our funders
- USED TO CONFIRM CEU COMPLETION

Needs & Demographic Survey Form

USDA Needs & Demographic Survey

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PATRICK BRYAN, PPRC FOG TRAINER AND TECHNICAL PROGRAM MANAGER

Stanislaus County, Hazardous Materials Inspector
County Of Fresno, NPDES Inspector
Municipal Interagency Training Coordinator

- EXPERIENCE SERVING AS A WASTEWATER AND STORM WATER INSPECTOR FROM THE COUNTY OF FRESNO, CALIFORNIA.
- BACKGROUND IN COMMERCIAL AND DEVELOPMENT PROGRAMS PATRICK UNDERSTANDS THE DISCONNECT THAT CAN OCCUR BETWEEN THE COMMUNITIES WE SERVE SUCH AS FOOD SERVICE ESTABLISHMENT'S (FSES), OTHER REGULATORY INSPECTORS/PROGRAMS AND WITHIN OUR OWN AGENCIES.
- BUILDING RELATIONSHIPS WITH INTERNAL DEPARTMENTS AND PRIVATE STAKEHOLDERS IS ESSENTIAL FOR A SUCCESSFUL FOG PROGRAM.

WHAT DATA IS NEEDED?

"AN EFFECTIVE FOG PROGRAM MUST BE DATA-DRIVEN, NOT EFFORT-DRIVEN"

GARY CHRISTIANSEN, CITY OF SEATTLE PUBLIC WORKS

- **WHAT DATA DO YOU NEED?**
- **HOW DO YOU COLLECT THE DATA?**
- **HOW IS THE DATA STORED?**
- **CAN THE DATA BE EASILY ACCESSED & ANALYZED?**

Collection System Maintenance

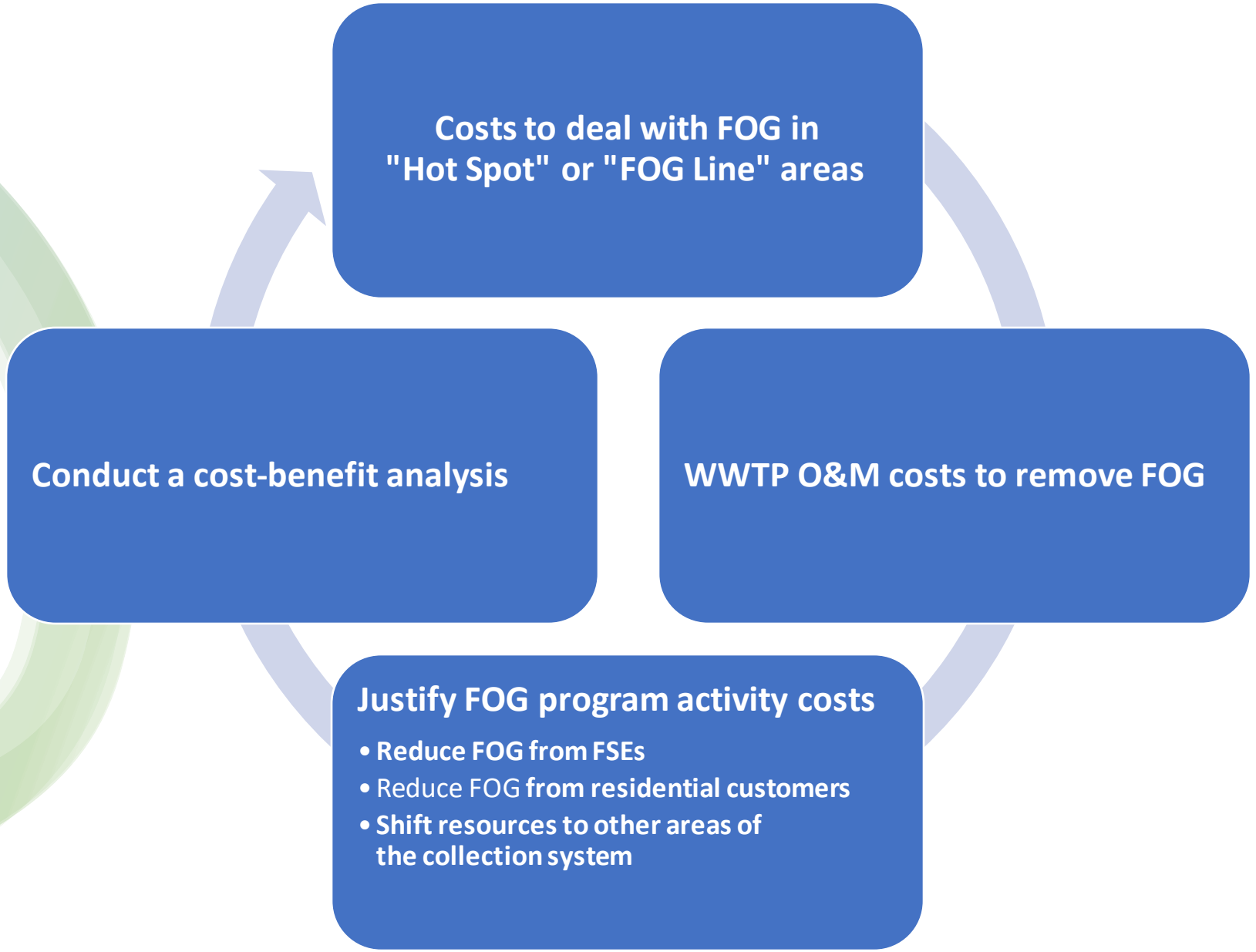
Sewer Line Cleaning

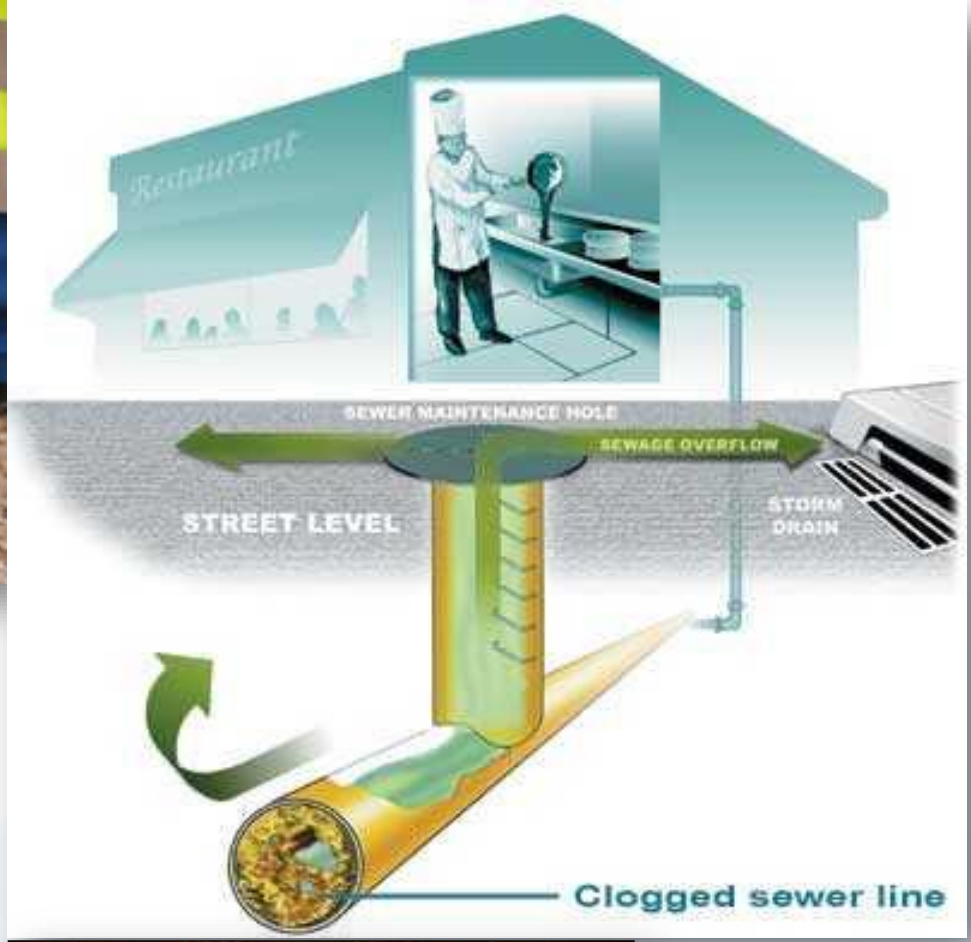
Source of photo: http://heritage20s.weebly.com/photos.html

WHAT DATA NEEDS TO BE COLLECTED TO QUANTIFY THE COSTS OF DEALING WITH FOG?

Data is needed to document the infrastructure operation & maintenance activities & associated costs

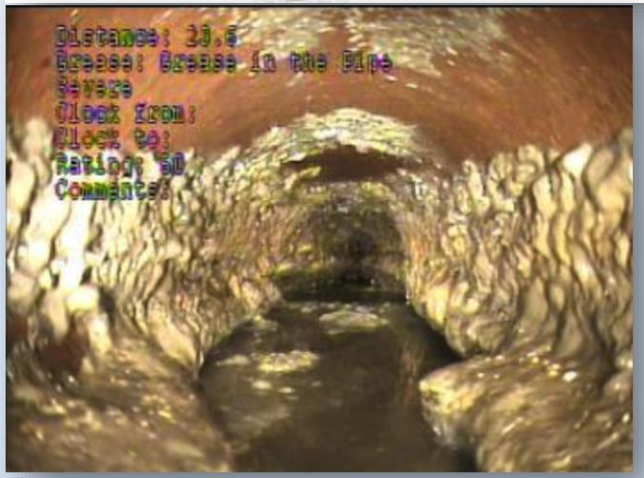
WHY DO WE NEED TO DOCUMENT THE INFRASTRUCTURE OPERATION & MAINTENANCE COSTS?





DOCUMENTING SEWER LINE CLEANING COSTS

- WHERE ARE YOUR FOG LINES?
- HOW OFTEN ARE THEY CLEANED?
- WHAT ARE THE EQUIPMENT AND STAFFING NEEDS?



Poll Question

EXCESS LINE MAINTENANCE COSTS

- How many linear feet of collection system are being cleaned in excess of the normal cleaning cycle (usually once every three to five years)?
- What is the city's cost per foot to clean lines?
- Is traffic control necessary, and if so, what is the cost?
- Where is the FOG disposed of, and what is the cost per gallon?

ANDOVER Kansas

Storm Sewer System Map

City of Andover, Kansas | 316.733.1303 | 1609 E. Central Ave. | Andover, KS 67002

Enter Search Address...

Global Perspectives

Reducing Sewerage Pump Blockages

Automated cleaning addresses growing challenge for wastewater systems

BY JAMES CHALMERS

Clogging — or 'ragging' — of pumps has become a huge problem for the global wastewater business. In the United Kingdom alone, it is estimated that water companies respond to around 300,000 blockages a year — at an annual cost of over €117 billion (US$138 million). However, there is a cost-effective and straightforward potential solution in the form of water-dedicated variable speed drives (VSDs) that integrate pump cleaning functions.

MWA in Brandenburg, Germany has used the VSD pump cleaning function since 2014. *Photo by Mittelmärkische Wasser- und Abwasser GmbH (MWA).*

Sewage pumps fitted with variable speed drives can monitor for a reduction in flow rate, and start an automatic cleaning sequence of reverse operation and/or a higher speed. *Photo by Mittelmärkische Wasser- und Abwasser GmbH (MWA).*

A GROWING CHALLENGE

Increasing amounts of fat, oil and grease (FOG) are entering household and commercial drains. Within the sewerage system they solidify, form floating crusts, coat pipe and pump surfaces, and envelop solid objects. These include items like wet wipes, sanitary products, cotton buds and even diapers, carelessly flushed down toilets. The resulting masses continue to gather FOG and other materials, creating fatbergs ranging in size from small to enormous proportions. The situation is not helped by today's trend for toilet cisterns designed to deliver flushes with a reduced volume of water which — although sensible as a water conservation measure — make it easier for FOG to settle and aggregate.

At their worst, blockages can stop a pump from working. It then needs to be mechanically lifted, opened up and manually cleaned. The downtime and labor costs involved are particularly high for pumps in remote locations. At lower levels, ragging adversely affects the pump's performance. Flows are reduced and extra strain is placed on the pump, resulting in higher energy consumption and faster wear. This in turn increases the need for inspection and maintenance action. A serious by-product of pump failure or loss of effectiveness may be flooding, which risks damage to property, pollution of natural waters, a need for clean-up operations, and fines — all of which add further expense. In addition, whenever floods occur or pumps need to be removed and handled, maintenance teams and communities are exposed to biohazards.

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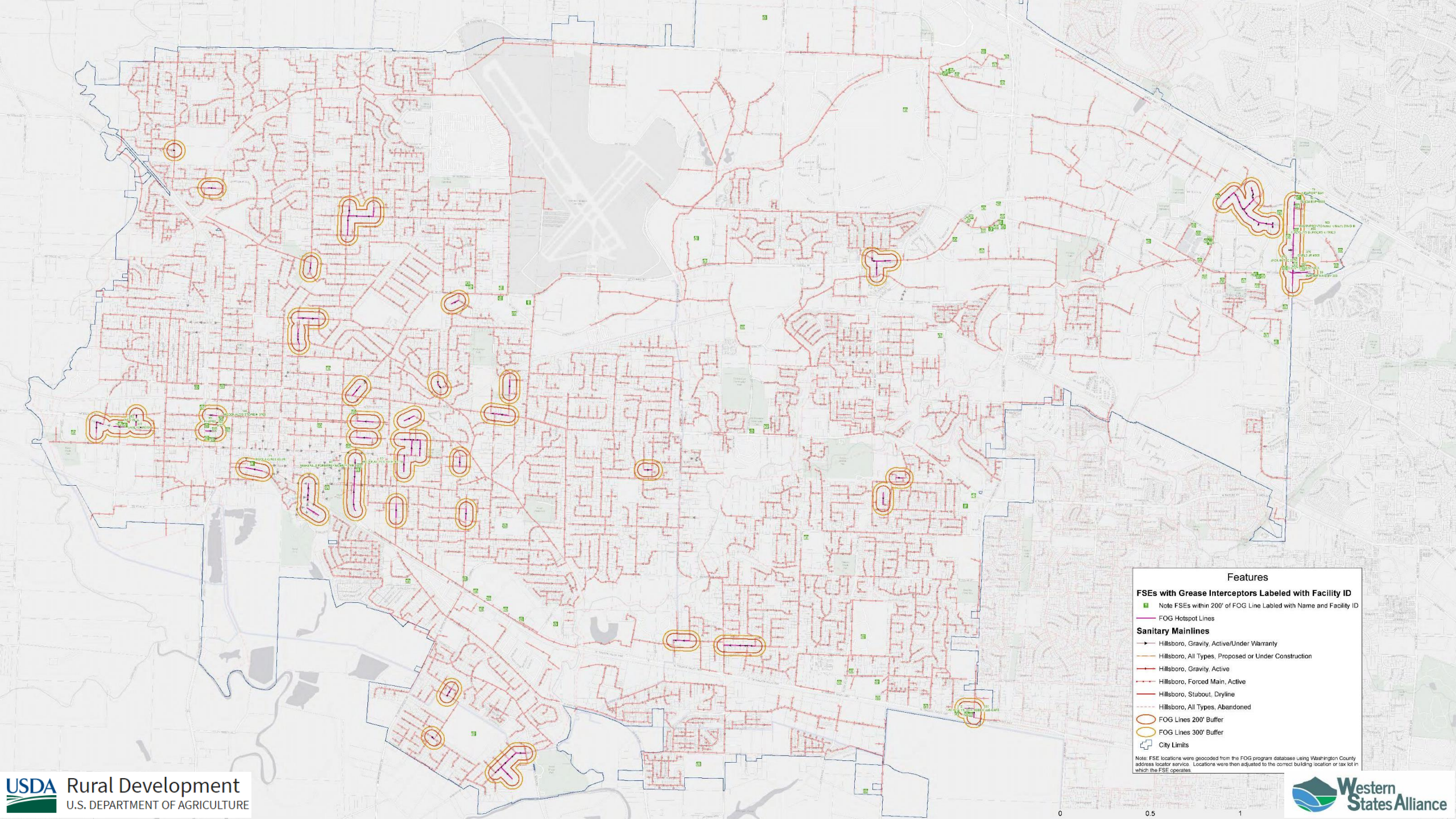

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Collection System Maintenance

Locate and Remove Sewer Line Blockages

Closed Circuit Television Camera (CCTV)

Collection System Maintenance

Sewer Line Cleaning

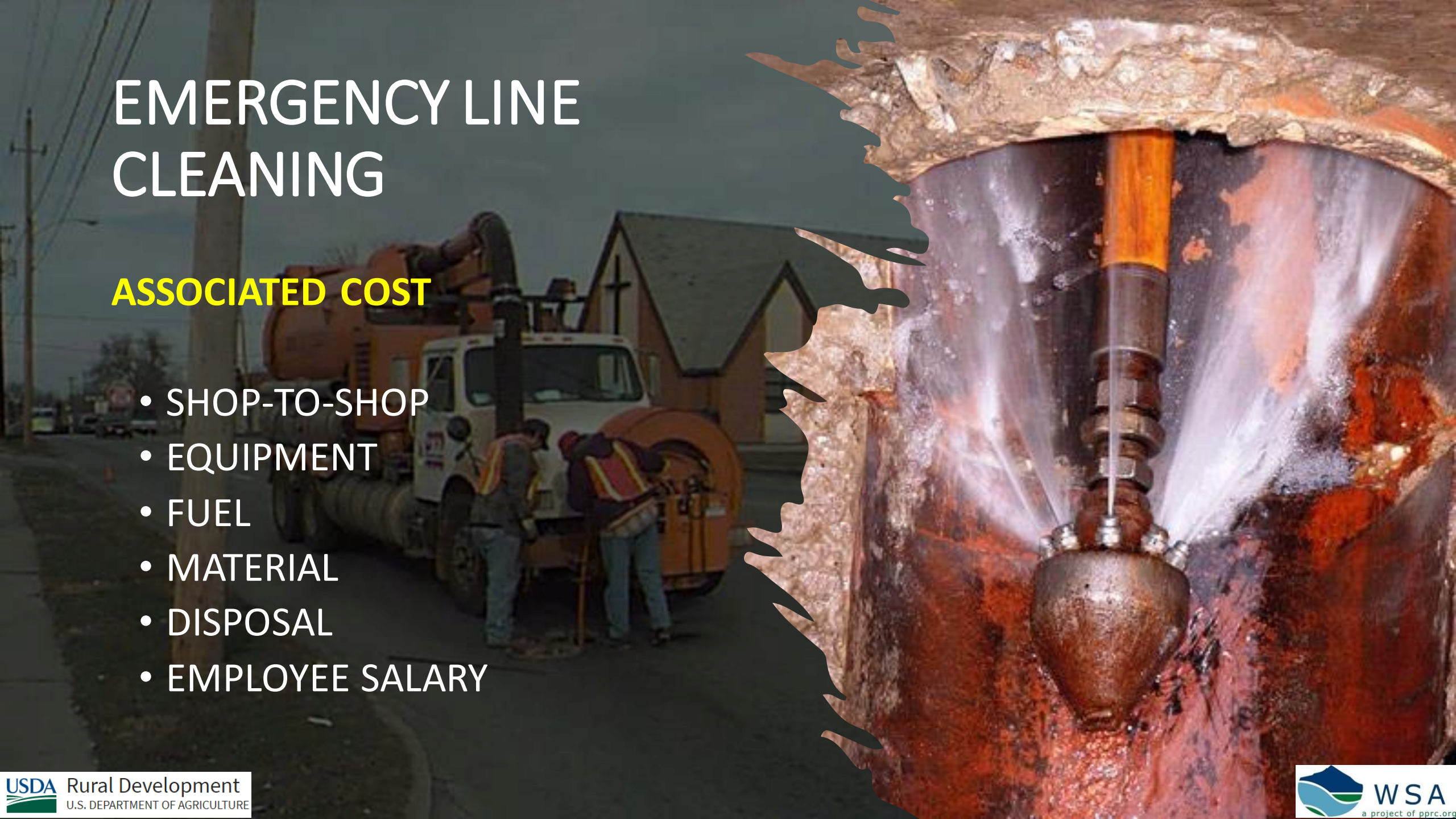
Vactor Truck

- Hydrojet
- Vacuum

EMERGENCY LINE CLEANING

ASSOCIATED COST

- SHOP-TO-SHOP
- EQUIPMENT
- FUEL
- MATERIAL
- DISPOSAL
- EMPLOYEE SALARY



FOG Abatement Program. EPA's enforcement response guidance, written in 1989, Guidance for Developing Control Authority Enforcement Response Plans is still valid and is a thorough and complete treatment of this subject.

The FOG Rules Template can be used to help create rules for a municipality. EPA created an example ordinance, EPA R8 Example Ordinance, that can be used for municipalities without approved pretreatment programs. The Plumbing and Drainage Institute created a Model Grease Ordinance that can be used to update or establish a grease ordinance.

Step 3:

Establishing Program Administration. There are overlapping jurisdictions within a municipality with an in interest and authority over Food Service Establishments (FSEs). Creating a FOG Abatement Program takes coordination and communication with many stakeholders. The FOG Abatement Program – Establishing Program Administration worksheet is useful to clarify motivations and outcomes for the program.

The fact sheet, Establishing an Ordinance to Control Fats Oils and Greases is effective to communicate with stakeholders about the need for a FOG Abatement Program and basic program components. View the fact sheet in English or Spanish

Step 4:

Developing the FOG Abatement Program. The overall program development includes selection of the approach for regulating facilities (e.g., permits, incentives, or education), establishing FOG handling and disposal practices, developing a database, and establishing an operating budget. The FOG Abatement program – Establishing the Business Case Worksheet helps identify all the costs currently being incurred by the municipality – the cost of doing nothing, plus it contains considerations for ongoing program, stakeholder engagement, and implementation costs.

Incorporating a Preferred Pumper Program (PPP) into your FOG Abatement program can save you and your FSEs time and money. This 4-minute video explains what a preferred pumper program is and the reasons to have one.

Establishing the Business Case Worksheets

Use to document costs

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TECHNICAL RESOURCES TAB

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National Resource Reference Guide | Western States Allia (westernstatesalliance.org)

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NON-ROUTINE/ RECURRING LINE CLEANING COSTS

FOG Abatement Program – Establishing the Business Case Worksheet

Utility FOG-line Cleaning Costs

What **data** is currently collected?

- FOG analysis by an environmental laboratory
- Photographs of grease interceptors or FOG build-up
- Videos of clean or dirty sewer lines
- FSE inspections
- Pump-out dates and quantities
- Other _____

How many **lineal feet of collection system are being cleaned** in excess of normal cleaning cycle (normal cleaning is typically 3-5 years)

Number of feet cleaned	Cleaning frequency (months)

What is the routine cleaning frequency for all other sanitary sewer lines?

- Every three years
- Every four years
- Other _____

NON-ROUTINE/ RECURRING LINE CLEANING COSTS

What is the cost to clean sanitary sewer lines per lineal foot?

Column A	Column B	Column C	Column D	
Time to clean each line section (hrs)	Fully loaded labor rate ($/hr)	Equipment cost ($/hr)	Traffic Control ($/hr)	Total cost (A*(B+C+D))

FOG REMOVAL DISPOSAL COSTS FROM SEWER LINES

What does it cost to dispose of FOG removed from lines?

Column A	Column B	Column C	Column D	Column E	
Number of Loads	Fully loaded labor rate ($/hr)	R.T. Time to haul waste FOG (hrs)	Transportation costs ($/load)	Disposal Costs ($/load)	Total disposal cost (A*(D+E)+B*C)

Transportation costs may be estimated based on the cost for renting equipment to move the waste FOG. Disposal costs are landfill tipping fees, the cost to mix FOG in with municipal biosolids, or to dry it, etc.

- Do you have a map of "FOG Lines" with Food Service Establishments (FSEs) proximity to them? (Use this to calculate costs, communicate with stakeholders, and prioritize inspections.)

Example Contractor Sewer Line Cleaning Bids

BID SCHEDULE

BID ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT	Company A UNIT COST	Company A TOTAL	Company B UNIT COST	Company B TOTAL
1	Mobilization and Demobilization	1	LS	$ 1,070.00	$ 1,070.00	$ -	$ -
2	Traffic Control System	1	LS	$ 10,000.00	$ 10,000.00	$ 41,400.00	$ 41,400.00
3	Sanitary Sewer Cleaning of 4 Inch up to 12 Inch diameter sewer pipelines via hydroject	10,100	LF	$ 1.90	$ 19,190.00	$ 1.37	$ 13,837.00
4	CCTV Inspection of 12-Inch diameter and smaller sewer pipelines	40,300	LF	$ 1.80	$ 72,540.00	$ 1.47	$ 59,241.00

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Currently Trainer, Western States Alliance, PPRC

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PUMP STATIONS ARE WONDERFUL INTERCEPTORS!

PUMP STATION COSTS

FOG Impacts on the Sewer System

Grease floating and accumulating on float switches and pipes

Grease build-up on submersible pump in lift station

Collection System Maintenance

Maintain Lift Stations

Clean

Not Clean

EXCESS PUMP STATION MAINTENANCE COSTS

- How many pump stations are impacted by FOG?
- What is the cost to clean FOG from a pump station?
- How many air relief valves are being impacted by FOG?
- What is the cost to clean the air relief valves?
- What is the efficiency loss for failure to clean air relief valves?
- Is excess energy being used due to FOG impacts?
- How much do "Additives" cost?

Air Release Valve Maintenance

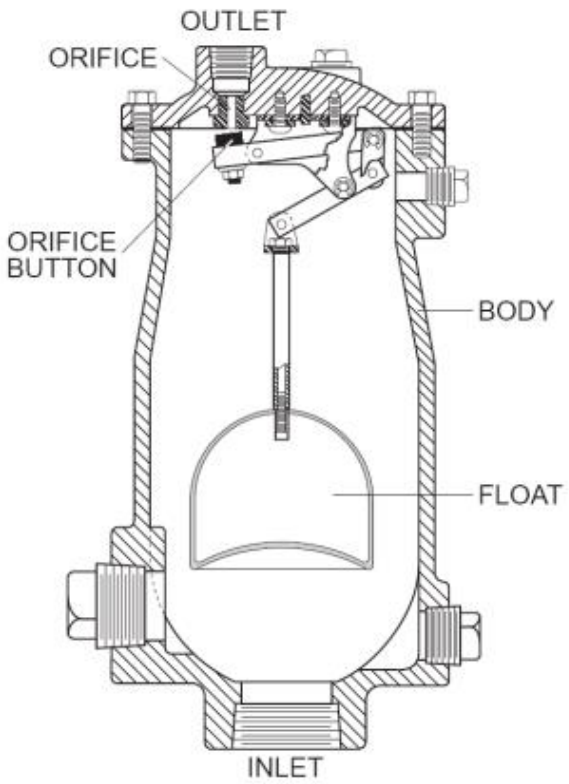

FIGURE 1. WASTEWATER AIR RELEASE VALVE

Courtesy of Val-Matic

NON-ROUTINE/ RECURRING PUMP STATION CLEANING COSTS

What is the cost to clean pump stations?

Column A	Column B	Column C	Column D	
Time to clean each pump station (hrs)	Fully loaded labor rate ($/hr)	Equipment cost ($/hr)	Traffic Control ($/hr)	Total cost (A*(B+C+D))

PUMP STATION FOG REMOVAL DISPOSAL COSTS

What does it cost to dispose of FOG removed from pump stations?

Column A	Column B	Column C	Column D	Column E	
Number of Loads	Fully loaded labor rate ($/hr)	R.T. Time to haul waste FOG (hrs)	Transportation costs ($/load)	Disposal Costs ($/load)	Total disposal cost (A*(D+E)+B*C)

- Are you cleaning air relief valves?
    i. What is the estimated cost of this?
    ii. If not cleaning air relief valves, are you monitoring electricity usage at the pump station?

    Perhaps air relief valves need to be cleaned.

NON-ROUTINE MANHOLE INSPECTION & MAINTENANCE COSTS

- How many manholes are impacted by FOG?
- What is the cost to inspect FOG-impacted manholes?
- What is the cost to clean FOG from a manholes?
- What is the decrease in expected life of FOG-impacted manholes?

Example Contractor Manhole Inspection Bids

BID SCHEDULE

BID ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT	Company A UNIT COST	Company A TOTAL	Company B UNIT COST	Company B TOTAL
5	Complete MACP Level 1 Manhole Inspection	203	EA	$ 75.00	$ 15,225.00	$ 86.50	$ 17,559.50

Manhole Assessment and Certification Program (MACP)
Level 1 inspection produces basic assessment information regarding the general condition of a manhole.

Non-routine Manhole Inspection, FOG Removal, & Replacement Costs

Manholes

What is the cost to inspect and maintain FOG-impacted manholes?

Column A	Column B	Column C	Column D	Column E	Column F	
Manhole O&M	**Number of Manholes**	**Average Labor (hrs/manhole)**	**Time Spent (hrs/yr)** (B*C)	**Fully Loaded Labor Rate ($/hr)**	**Equipment Cost ($/hr)**	**Total Annual Cost ($/yr)** (D*(E+F))
Manhole inspections						
FOG Removal						
Total Annual Cost ($/yr.)						

What is the cost to replace FOG-impacted manholes?

Column A	Column B	Column C	Column D	Column E	Column F	Column G	
Manhole Replacement	**Number of Manholes (mh)**	**Average Replacement Cost ($/mh)**	**Time Spent (hrs/mh)**	**Fully Loaded Labor Rate ($/hr)**	**Equipment Cost ($/hr)**	**Bypass Pumping ($/hr)**	**Total Annual Cost ($/yr)** ((B*C)+(D*(E+F+G)))
Manhole replacement							
Total Annual Cost ($/yr.)							

Poll Question

FOG IMPACTS ON WASTEWATER TREATMENT PLANTS

EXCESS TREATMENT PLANT OPERATIONAL COSTS

- What is the estimated operational cost to treat one pound of COD?
- WERF estimates 1 pound of FOG = ½ pound of COD
- Case studies show that an average restaurant, with one fixture protected by a well-maintained interceptor, captures 1/10th the FOG of a restaurant with all fixtures and drains connected to a well-maintained interceptor.
- How many restaurants in the jurisdiction have all fixtures and drains protected by an interceptor?

FOG Impacts on Wastewater Treatment Plants

PRELIMINARY TREATMENT

PRIMARY TREATMENT

FOAMING ON THE AERATION BASIN

FOG Impacts on Wastewater Treatment Plants

Secondary Clarifiers and Sludge

FOG Impacts on Wastewater Treatment Plants

- **Disinfection**
- **Enforcement action by State or EPA**
  - **Floatable solids in the effluent is a discharge permit violation**

FOG IMPACTS ON WASTEWATER LAGOONS (OXIDATION PONDS)

- TREATMENT
- ODORS
- Discharge OUTLET
- Mechanical REMOVAL
- Disposal

TRACKING STAFF COSTS

Can you track costs via a time card code?

How granular should you be?

Code for line maintenance for FOG

Code for treatment plant maintenance for FOG

Code for pump station maintenance for FOG

Estimated FOG-Related WWTP Costs

Column A	Column B	Column C	Column D	Column E	
WWTP O&M	**Time Spent (hrs/yr.)**	**Fully Loaded Labor Rate ($/hr)**	**Equipment Cost ($/hr)**	**Disposal Cost ($/lb. removed)**	**Total Annual Cost ($/yr.)** B*(C+D)+E)
Cleaning preliminary treatment unit					
Cleaning clarifier weirs					
Sludge disposal					
Other					
Other					
Other					
Total Annual Cost ($/yr.)					

Estimated FOG-Related WWTP Costs

Method 1

Column A	Column B	Column C	
WWTP Treatment	**Grease Removal Device Bypass* (lbs/year)**	**Cost per Pound of FOG ($/lb)****	**Total Annual Cost ($/yr.)** (B*C)
FOG Discharge from FSEs			

* Bypass is the FOG not captured by the GRD (estimated ~15% for GGIs, ~5% for HGIs)
Use grease production value for each FSE (ASPE Design Handbook, Volume 4, Chapter 8, Table 8.3)
** 1 lb. FOG = 0.5 lb.COD, Use COD surcharge rate ($/lb.)

Method 2

Column A	Column B	Column C	Column D	Column E	
WWTP Treatment	**Influent FOG Concentration (mg/L)**	**WWTP Flow (MGD)**	**Influent FOG (lbs./day)**	**Cost/lb. of FOG ($/lb./day)***	**Total Cost ($/yr.)**** (E*365)
Influent FOG to WWTP					

* 1 lb. FOG = 0.5 lb.COD, Use COD surcharge rate ($/lb.)
** Calculate cost per yr. 365 days/yr. for annual cost

PATRICK BRYAN, PPRC FOG TRAINER AND TECHNICAL PROGRAM MANAGER

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Municipal Interagency Training Coordinator

- EXPERIENCE SERVING AS A WASTEWATER AND STORM WATER INSPECTOR FROM THE COUNTY OF FRESNO, CALIFORNIA.
- BACKGROUND IN COMMERCIAL AND DEVELOPMENT PROGRAMS PATRICK UNDERSTANDS THE DISCONNECT THAT CAN OCCUR BETWEEN THE COMMUNITIES WE SERVE SUCH AS FOOD SERVICE ESTABLISHMENT'S (FSES), OTHER REGULATORY INSPECTORS/PROGRAMS AND WITHIN OUR OWN AGENCIES.
- BUILDING RELATIONSHIPS WITH INTERNAL DEPARTMENTS AND PRIVATE STAKEHOLDERS IS ESSENTIAL FOR A SUCCESSFUL FOG PROGRAM.

PROGRAM DEVELOPMENT COSTS

WHAT WILL IT COST TO DEVELOP A FOG ABATEMENT PROGRAM?

USDA Rural Development
U.S. DEPARTMENT OF AGRICULTURE

WSA
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ELEMENTS OF AN EFFECTIVE FOG PROGRAM

Estimate the staffing level and the cost for each program element

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ESTIMATE THE COST TO IMPLEMENT OR ENHANCE YOUR FOG PROGRAM

- How many Food Service Establishments (FSEs) are in the City?
- Will you register or issue a discharge permit each FSE?
- How many FSEs have been/need to be thoroughly inspected and monitored? How often?
- What data and information has been/needs to be tracked for each FSE?
- What type of public education & outreach will be done?
- What level of Stakeholder involvement is desired?

ESTIMATE FOG PROGRAM STAFFING COSTS

- How many FSE inspections can be completed in one day?
- How many Full Time Employees (FTEs) will be needed to initiate the program?
- How many FTEs will be needed to maintain the program?

FOG PROGRAM STAFFING EXAMPLES

- City of Vancouver, Washington has approximately 800 FSEs and has two full time FOG inspectors
- Washington County, Oregon has approximately 2,400 FSEs and has one full-time and five part-time FOG inspectors
- City of Portland has approximately 4,100 FSEs and three full-time inspectors and a program manager
- Friday Harbor, Washington has about 75 FSEs and one part-time inspector
- Wilsonville, Oregon has 99 FSEs and one full-time industrial pretreatment inspector who is also responsible for the FOG program

WHAT STAFFING LEVEL IS APPROPRIATE?

- Initial FSE inspection setting up FOG Program estimate 3-4 hrs./FSE
- Efficient FOG program maintenance inspections estimate 1 hr./FSE
- Include travel time
- Include inspection data entry time
- Include pump-out data review time
- Estimate that 10% FSEs will need re-inspection more frequently than once per year

Poll Question

SESSION 1

BUSINESS CASE SUMMARY SLIDE

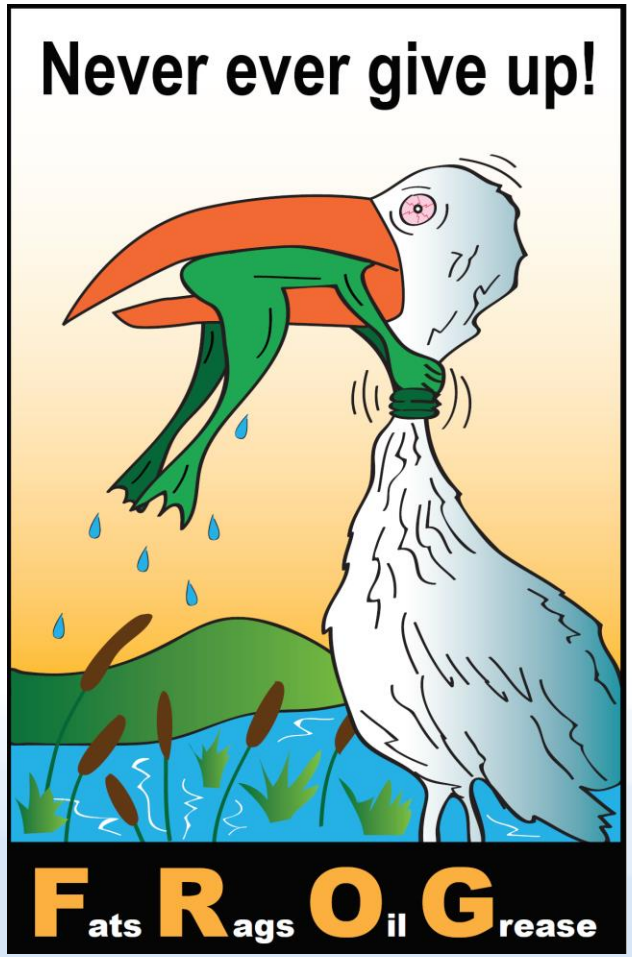
Session 1

- **Establishing the Need for a FOG Program**
- **Data Needed**
- **Excess Operation & Maintenance Costs**
- **Staff Costs**
- **Program Development Costs (Part 1)**

Session 2

- Planning
- Program Development Costs (Part 2)
- Data Acquisition and Management
- Cost-Benefit Analysis

CONTACTS:



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THANK YOU FOR ATTENDING SESSION 1
USDA FOG PRETREATMENT TRAINING

RAPID RESPONSE --
https://pprc.org/rapid-response/
PPRC provides free and well-researched answers to specific questions about pollution prevention, with thorough and unbiased answers to inform decision making.

End of Session 1

See you tomorrow!