CMOM – Commercial and Residential FOG, Corrosion, and Sewer Maintenance Personnel and Pretreatment Personnel Communication

*SSOs

*ID of Blockages

*FOG Program

*Corrosion Control

*Interaction with Pretreatment Program

MMS
Monitoring and Management Services

POTW: Publicly Owned Treatment Works

- Wastewater Treatment Plant
- Sewer Pumping Stations
- Sewer Pipes and other conveyances
- Also...Any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. 40 CFR 403.3 (0). *What is CFR?*

Code of Federal Regulations (CFR)

- The Industrial Pretreatment Section is responsible for meeting the Pretreatment CFR requirements as well as State and Local Requirements
- Federal Regulations:
  - 40 CFR Part 403: General Pretreatment Requirements
  - 40 CFR Parts 405 through 471: Categorical Industrial User Regulations
    - Examples: Metal Finishing, Pulp-Paper-Paperboard, Iron & Steel, Porcelain Enameling, Pharmaceutical Manufacturing

Sewer Maintenance Personnel assistance with Pretreatment Program

- Planning and communication necessary to meet CMOM requirements as well as the Federal, State and Local Industrial Pretreatment Requirements
- “Interference” : “a discharge...that inhibits...or disrupts a POTW, its treatment processes and operations...”
- Specific Prohibitions:
  - 40 CFR 403.5 (b) (2): Pollutants which will cause **corrosive** structural damage to the POTW...
  - 40 CFR 403.5 (b) (3): Solid or viscous pollutants in amounts which will cause **obstruction** to the flow in the POTW resulting in interference

Pretreatment Program

- **Communication** with Pretreatment Program for Non-Domestic User (industrial, commercial, restaurants) Interference includes:
  - Date
  - Time
  - Personnel Involved
  - Specific Location
  - Specific Problem
  - Gathering as much information as possible at the time of the event to determine the source
    - Checking upstream and downstream manholes
    - CCTV

Food Service Establishment Sampling & Analysis (from 325 FSEs)

- Average pH from Interceptor: 5.0 std. units (range 1.2 to 11.5)
  - Low pH: anaerobic conditions, sugars, cleaners, soft drinks
  - High pH: additives, cleaners, vent hood cleaning (NaOH)
- BOD5 from monthly pumped interceptor with all components can be 500 to 1,000 mg/L. What about facilities that do not have adequate grease control equipment or are not maintaining the equipment?
- O&G from 20 mg/L to 2,500 mg/L. Depends on time of day, type of restaurant, type of grease control equipment, etc...

When you see heavy FOG, need to document and communicate to Pretreatment or Enforcement Section

ID of FOG severity (categories)

FOG: Light film (< 5% FOG)

FOG: Slight “wings” (10% FOG)

ID of FOG severity (categories)

FOG: Moderate (25% FOG)

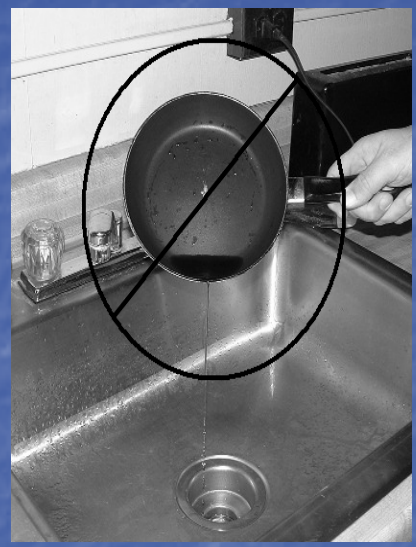
ID of FOG severity (categories)

FOG: Heavy (> 25% FOG)

Residential FOG

- Identify specific sewer line segment that has FOG impact
- Check upstream and downstream manholes or CCTV area to try and locate specific FOG sewer line connection sources
- Document with pictures or video
- Distribute door-hangers to residents, or turn in information for residential mail-out notification or phone call
  - There are other residential FOG awareness materials that can be distributed

Residential FOG Prevention



Document the residential FOG blockage and SSO response activities you do!

Residential FOG education items can include:

- Decals on City vehicles, buses, etc...
- Mail out of Residential FOG Notification letters
- Phone calls to customers in areas that FOG blockages have been identified
- Brochures, doorhangers
- "Can the Grease" program
- Television commercials (No FOG Dog)

Reporting SSOs

- Experience has indicated that many sewer line blockage “CAUSES” are not listed correctly.
  - This can result in future incorrect allocation of resources
- Need to identify the PRIMARY CAUSE of the blockage…

  *FOG *Roots *Structural *Gravel

  *Rags/clothing *Debris
- Example: Initial SSO cause was FOG, but CCTV revealed roots as primary cause

Reporting SSOs

- If unknown at the time, report as Sewer Line Blockage, Cause under investigation.
  - Have follow-up investigation
  - Conduct CCTV of sewer line
  - Report “primary cause” to State based on findings of investigation

Sewer Cleaning

- What is response to a FOG blockage?
- Water Jetting – Be careful not to wash heavy or moderate FOG downstream because this can cause a future SSO or obstruction.
- Best to Vactor heavy FOG

CCTV

- Identify specific FOG sources
- Record sewer connection information and pictures or video so corrective action can be taken. This is quickest and best way to have food facility install or upgrade their grease control equipment

Sewer Maintenance & the FOG Program

- Considerations
  - Sewer Slope
  - Sewer Materials
    - FOG can cause corrosion
    - Some Food Service Facilities have low pH, low alkalinity, high temperature discharges (coffee shops)
  - Sewer Structure
    - 90 degree turns
    - Connections not going to invert of sewer

Does a particular sewer line segment need to be repaired or do we continue to do maintenance due to a slope or structure issue?

Communication & Data Tracking are CRITICAL

- FOG related SSOs and blockages. ID following
  - Sewer line segment impacted
  - Commercial or Residential, assist with source identification
  - Confirm primary cause is FOG. May be roots, structural, gravel, rags.
  - From information received from CCTV and Sewer Cleaning Personnel the Pretreatment staff will be able to implement enforcement action
- Goal is to not have to do repeat cleaning & sewer maintenance. Be able to move to new sewer line segments

Corrosion Control

- Development & implementation of site-specific corrosion control measures (hydrogen sulfide or other corrosives)
- Monitoring program to evaluate corrosion control measures? Documentation?
  - Chemicals Added? Volume per day, week, month?
  - Weather conditions
  - Field Analysis, Pictures
- Performance measures, and mechanism to include corrosion control program in Information Mgt. System.
  - Trend Analysis- Improvements?

Corrosion

- Hydrogen Sulfide-anaerobic decomposition of sulfate
  - FOG can contribute to sulfide formation in sewer pump stations and in collection system
  - Also, **sulfate** can react with calcium in concrete to form calcium sulfate, which can cause concrete to crack
- Chloride
  - Can cause decay and penetrate coatings
- Chlorine
  - HCl and HOCl can increase rate at which iron and steel corrode
- Nitrates and Nitrites
  - Can contribute to iron and steel corrosion
- Dissolved Salts
  - Electrolytic action on base material can corrode concrete, cement mortar
- Organic Compounds
  - Solvents will promote the dissolution of gaskets and rubber and plastic linings

Interceptor deterioration, baffle wall collapse, leaking, and corrosion impact to public sewer

Krispy Kreme pH adjustment system

Food Service Establishments can cause corrosion in sewer lines

Other sources of corrosion

Sewer corrosion below a coffee shop

Food Service Establishments…

***Coffee Shops**

(coffee pH 4.6 to 5.1)

***Bakeries, FSEs with high sugar use**

Industrial Users: Dairy products, colas

Sewer Maintenance personnel need to be on watch for corrosion problems in sewer system

Corrosion due to Food Service Establishment

Industrial User Corrosion

- Corrosion impact may be further downstream than immediate downstream manholes.
  - Example: SIU initially discharges to 400 feet of PVC pipe, but then goes to concrete and iron pipe. Collapsed sewer resulted after 12 years of SIU discharge.
- Not just pH, but also alkalinity (buffer capacity) can play role
- CCTV personnel need to record sewer system impacts below IU's, especially those associated w/ dairy products, bottling operations, use of DI water & cleaners, metal finishers, etc... (scheduled CCTV)

Sewer Corrosion below Industrial User

Priorities and Performance Measures

- Information Mgt. System should be able to reference sewer maintenance activities related to FOG and corrosion with Food Service Establishments and Industrial Users.
- When repeat sewer cleaning and maintenance has to be performed for any blockage or corrosion problem, this should trigger investigation response to get problem corrected.

Performance Indicators

- Corrosion Monitoring
  - Hydrogen sulfide monitoring location trends
  - Recording pH, ORP and other measurements at odor problem areas or below IU's
  - Additives used, volume of product, effectiveness. Track costs.
  - CCTV results below IU's (annual comparison), sulfide or odor problem areas, or below FSEs. Work with Pretreatment staff on locations and communicating results.
  - Sewer line replacement or repair due to corrosion. Track costs.

Performance Indicators

- FOG Program
  - Document Costs of sewer line cleaning related to each primary cause- personnel, equipment
    - Is it a repeat sewer line cleaning? Or on regular schedule to clean because of FOG? Need to find source and stop FOG discharge instead of continuing to have to clean.
  - Record Followup actions taken, record dates that previous blockage area was checked. Is this chronic, recurring problem? How often is cleaning required?
    - Documentation of sewer cleaning activities for each site will indicate if IWD needs to escalate enforcement action.
  - Residential vs Commercial SSOs or blockages tracking (FOG primary cause?)
    - Number of residential notifications (letters, doorhangers, phone calls).
    - Education Material types and distribution

Other CMOM information sources

- http://cfpub.epa.gov/npdes/sso/toolbox.cfm?program_id=4
  - use _ between “program” and “id”

- www.epa.gov/ebtpages/watestormsanitaryseweroverflowssos.html

Also, see **U.S. EPA “Guide For Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems”**