Illicit Discharge Detection and Elimination

In the City of Duluth

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City of Duluth
Utility Operations

Illicit Discharge Detection and Elimination

The reason, To remove all non storm water discharges

City of Duluth

- Provides service for 86,918 residents
- 26 miles long, 8 miles at its widest point
- Lake Superior 602 ft above sea level
- Thompson hill 1,485 ft above sea level
- Elevation difference of 883 ft

City of Duluth
Sanitary Sewer System

- 26,000 Wye connections
- 450 miles of sanitary sewer pipe divided into 30 basins
- 45 lift stations
- 109 + Grinder pumps
- 3 Sanitary sewer storage basins
- 8,000 + manholes
- Parts of our system dates back to the 1880's

City of Duluth
Storm Sewer System

- 609 Miles of road
- 431 Miles of storm sewer
  - Wood pipe used until 2006
- 138 Miles of ditch
- 17 Sedimentation boxes
- 11,000 + Catch Basins
- 43 Named creeks and streams
- 16 Trout streams
- 500 “NPDES” outfalls

Illicit Discharge Detection and Elimination

- City Program on illicit discharge
- City Procedure on illicit discharge
- Water Quality Specialist
- Tools
- How does it work after notification
- Investigations

Illicit Discharge Detection and Elimination

- City Program
  - Purpose
    - The intent of the program is to identify investigation practices to be conducted by the City of Duluth to eliminate all illicit discharges as defined in the city code

Illicit Discharge Detection and Elimination

- City Procedure
  - Purpose
    - The stormwater system is design to convey only stormwater
    - Any material other than stormwater is prohibited
    - When pollutants are detected, the City is responsible to identify and remove the source
    - The city has a procedure in place to eliminate illicit discharges

Illicit Discharge Detection and Elimination

- Having personnel that are available to go out and investigate at anytime of the day/night
  - **This is one of the most important component**
  - Use a designated position to investigate, WQS or train your utility staff to perform the investigation.

Illicit Discharge Detection and Elimination

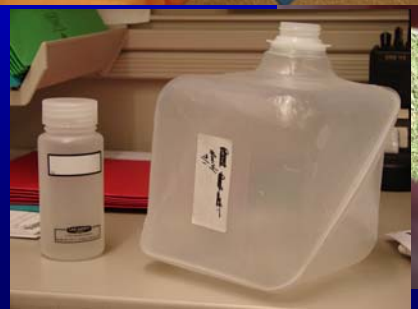
- **Water Quality Specialist (WQS)**
  - – Works with Storm Sewer and Sanitary Sewer Systems
    - Water quality issues
    - Water issues (flooding)
    - Erosion
    - I/I program
    - Illicit discharge
    - Sewer connection/disconnection inspection
    - Work with construction / utility crews

Illicit Discharge Detection and Elimination

- Tools to help locate illicit discharges
  - The public, they can help in finding Illicit discharges
  - Utility staff
  - Other agencies
  - The person that reported the Illicit discharge
  - Maps (paper or GIS system)
  - Knowledge of storm sewers, drainages and creeks
  - In stream monitors (flow data)

Illicit Discharge Detection and Elimination

- Tools to use in the field
  - Camera
  - GPS
  - Transparency tube
  - Conductivity meter
  - Pocket thermometer
  - Water testing bottles (work with a lab)
  - Water testing kits (***USER MUST BE TRAINED IN USE OF THE KITS***)



Illicit Discharge Detection and Elimination

- How does the program work after notification
  - Illicit discharge reported
  - Work order filled out then assigned to WQS
  - Investigation
  - Notify the office of the problem
  - Correction (if possible)
  - Complete work order
  - Report back to the person that reported the illicit discharge

Illicit Discharge Detection and Elimination

- Work Order should include
  - Persons name and contact information
  - Location of discharge or suspicious material
  - Time and date of there observation and the time they called you
  - Description of material
  - Any other pertinent information that they can give

Illicit Discharge Detection and Elimination

- Work Order
  - Work order is forwarded to a WQS
  - All illicit discharge work orders are treated as Emergency or High priority
  - ***We investigate all Illicit discharge reports***

Illicit Discharge Detection and Elimination

- We will visit the site in a attempt to identify the illicit material
  - Use visual observation
  - Exhaust every possible source as soon as possible

  This may take time and considerable effort

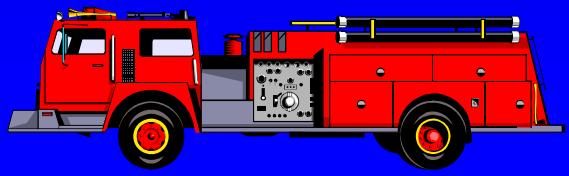
- Investigation of the source
  - Follow the trail of the discharge
    - Visual observations
    - CCTV
    - Dye test
    - Sampling upstream area's to locate the discharge

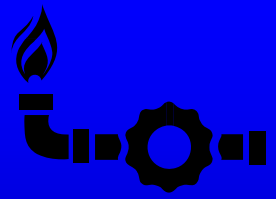
Illicit Discharge Detection and Elimination

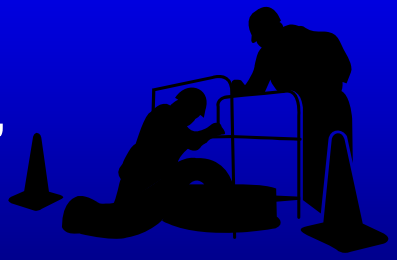
- Sampling if material can’t be identified
  - Sampling is expensive, try to work with your local sanitary district, watershed district, or independent lab
  - Follow there procedure’s to ensure proper handling of the sample

Illicit Discharge Detection and Elimination

- Notification of problem
  - Office
    - Duty officer
    - Fire Department - Hazmat
    - Utility Company
    - MPCA
      - Notify in order of importance, depends on substance







Illicit Discharge Detection and Elimination

- Correction of the Illicit Discharge
  - **One time discharge**
    - Oil or paint in a catch basin
    - Carpet cleaning solution
  - Notify other municipalities if the discharge flows into or through there jurisdiction
  - Clean the area or storm sewer system
  - Talk with home owner or person involved
    - Explain where the storm sewer flows
    - Possible penalties

Illicit Discharge Detection and Elimination

- Correction of the Illicit Discharge
  - This should happen in a reasonable amount of time
  - Sanitary sewer leak or cross connection
    - If on the public system, repair is done ASAP as a *Emergency Repair*
    - If on the private side, The City will issue a notice to correct
      - This can take time – funding, sewer extension, common lines, easements
      - Call Duty Officer
    - Track to make sure corrective action has taken place
    - Dye test to confirm corrective action (if needed)

Illicit Discharge Detection and Elimination

- Correction of Illicit Discharge
  - Chemical / Other
    - Review activities in area to find the source
    - Identify material (if possible)
    - Notify appropriate agencies
    - Review the problem with source, *if possible*
    - Initiate corrective action ASAP
    - Verify corrective action has taken place

Illicit Discharge Detection and Elimination

- Complete the work order
  - Tracking of the illicit discharge (completed or active)
  - Fill it out completely
  - Keep it on file

Illicit Discharge Detection and Elimination

- Report back to the person that reported the illicit discharge
  - Remember: The public can help in finding Illicit discharges
  - We need to keep the public aware of what we are doing to find and remove illicit discharges

Illicit Discharge Detection and Elimination

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Illicit Discharge Detection and Elimination

- Oil sheen floating on Lake Superior
- 1st rain event in spring
- Entering the storm sewer through a Catch Basin at 52nd Ave E
- Oil coming from roadway (build up from a winter)

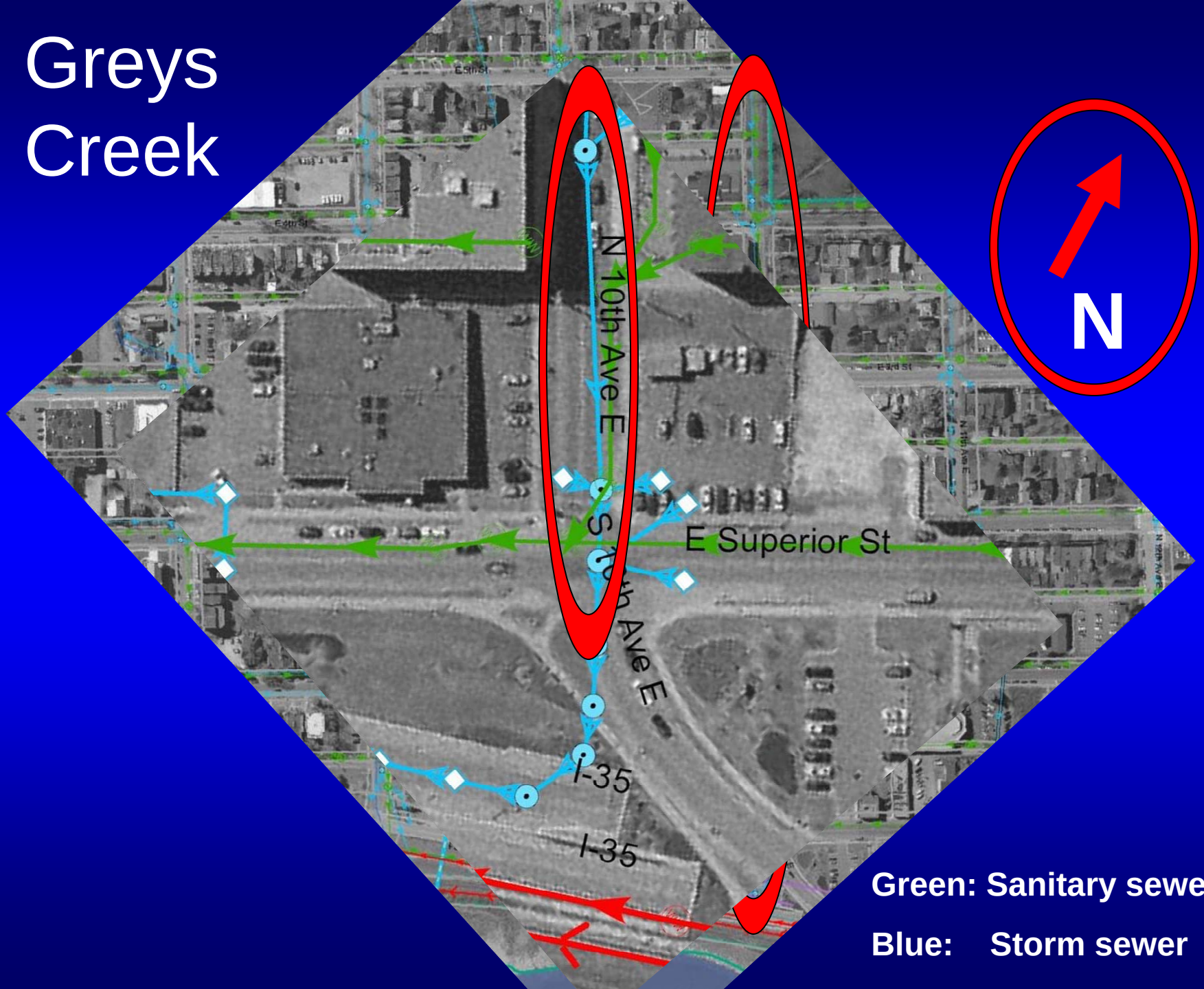
Illicit Discharge Detection and Elimination

- Chester creek
  - Sewage smell under a bridge (middle of winter)
    - Located a wall of Ice
    - Small discharge from a storm sewer pipe
    - Followed the storm sewer upstream catch basin to catch basin for 5 city blocks
    - Found a sanitary line backed up, sewage flowed under the pavement and into a storm sewer MH
    - Notified office and duty officer
    - Cleaned sanitary line and stopped the overflow

Illicit Discharge Detection and Elimination

- Greys Creek
  - WLSSD sampled the mouth of the creek, and it had high fecal coliform counts
  - City of Duluth worked with WLSSD to sample our storm sewer system to locate the area of the high counts

Greys Creek



Green: Sanitary sewer

Blue: Storm sewer

Illicit Discharge Detection and Elimination

- We used CCTV to find the problem
  - Broken sanitary sewer pipe over the top of the storm sewer
  - Posted the mouth of Greys creek

Illicit Discharge Detection and Elimination

- Gas station
  - 13 Ave E & 9th St.
  - Discharge of water from a fuel tank area at station
  - Dyed sanitary sewer and storm sewer

Keep office informed as to what you are doing

Illicit Discharge Detection and Elimination

- Foam in the Streams
  - Call from the public regarding foam and bubbles in the streams
  - Foam caused by soap will have a perfume smell
  - Foam caused by nature will smell fishy, this is caused by the break down of organic material in the water that act as "surfactants

Illicit Discharge Detection and Elimination

- **If you see something call 730-4130**

A WQS will look at it and investigate