

Our Sewer-Swimmin'-Summer



Photo Illustration: Iben de Neergaard

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Topics

- Flow Monitoring
- H₂S Inspections
- Manhole Locates

Flow Monitoring

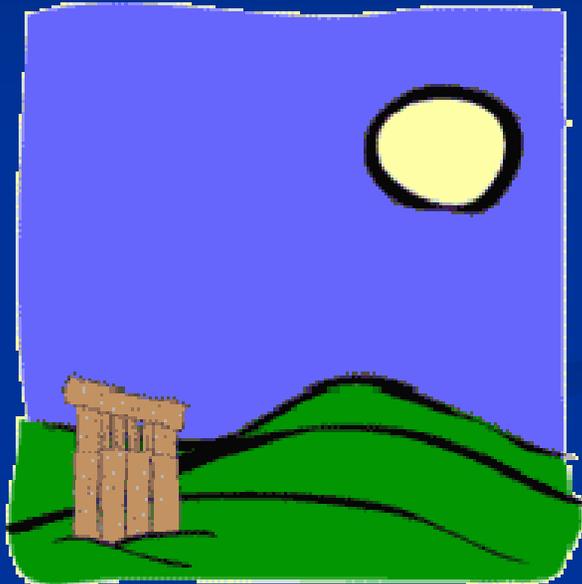
- Why is Flow Monitoring important?
- Meter overview
- Data Analysis
- Verifications / Entries
- Traffic and Flagging



Why do we do it???

- Big budget projects
- Also, to understand why we see unusual occurrences...

Where sewer abnormalities come from...



<http://fapel.org/animation3.gif>

FLO-DAR Meters

- Velocity by radar
- Depth by ultrasonic pulse echo
- Both measured from outside the water



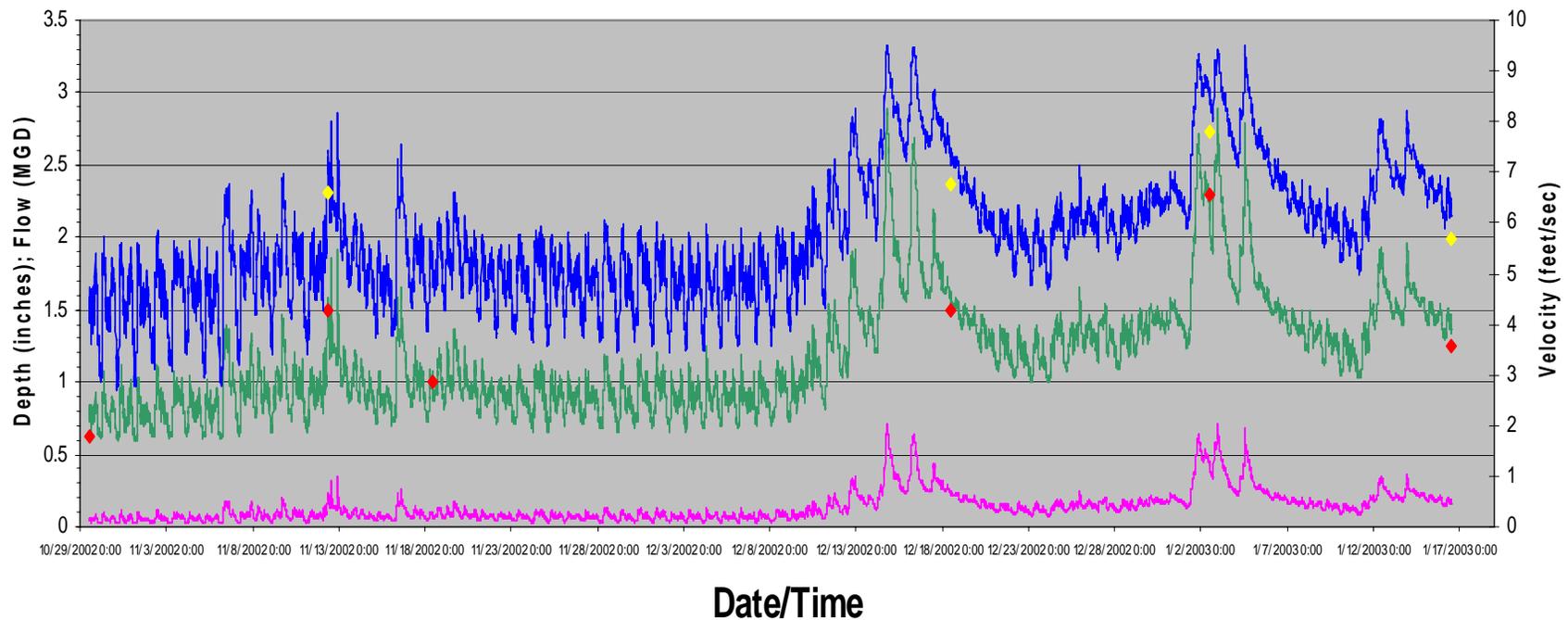
ADS Meters

- Depth from above water
- Velocity from in water
- Both measured by ultrasonic pulse echo



Data Analysis

Skyway Pilot (raw) flow data 10/29/02 to 1/16/03



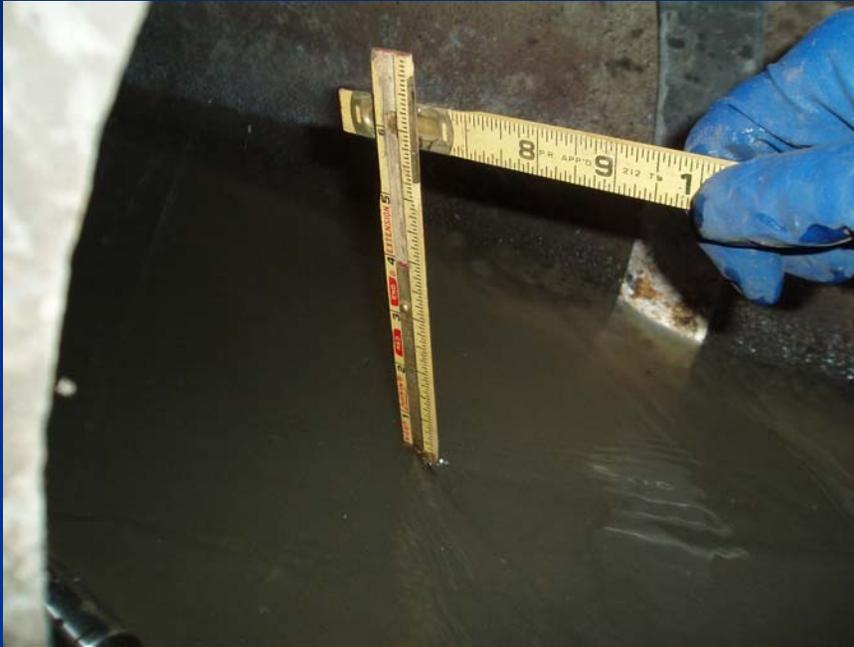
— Depth (inches) — Flow (MGD) ♦ Field Depth Cals — Velocity (feet/sec) ♦ Field Velocity Cals

Average/Peak used = 0.95

Verifications



Verifying Meter Accuracy



$$Q = V * A$$

The First Entry...













Sheena's First Confined Space Entry



Brian Returning from the Depths...



Traffic and Flagging

- Cones
- Freestanding Signs
- Handheld Signs
- Flagger Training



H₂S Inspections

- What causes H₂S?
- How is it prevented?
- Odor control (Bioxide™)
- Equipment used
 - Jerome meter
 - DO, pH, Conductivity
 - Dissolved Sulfides testing



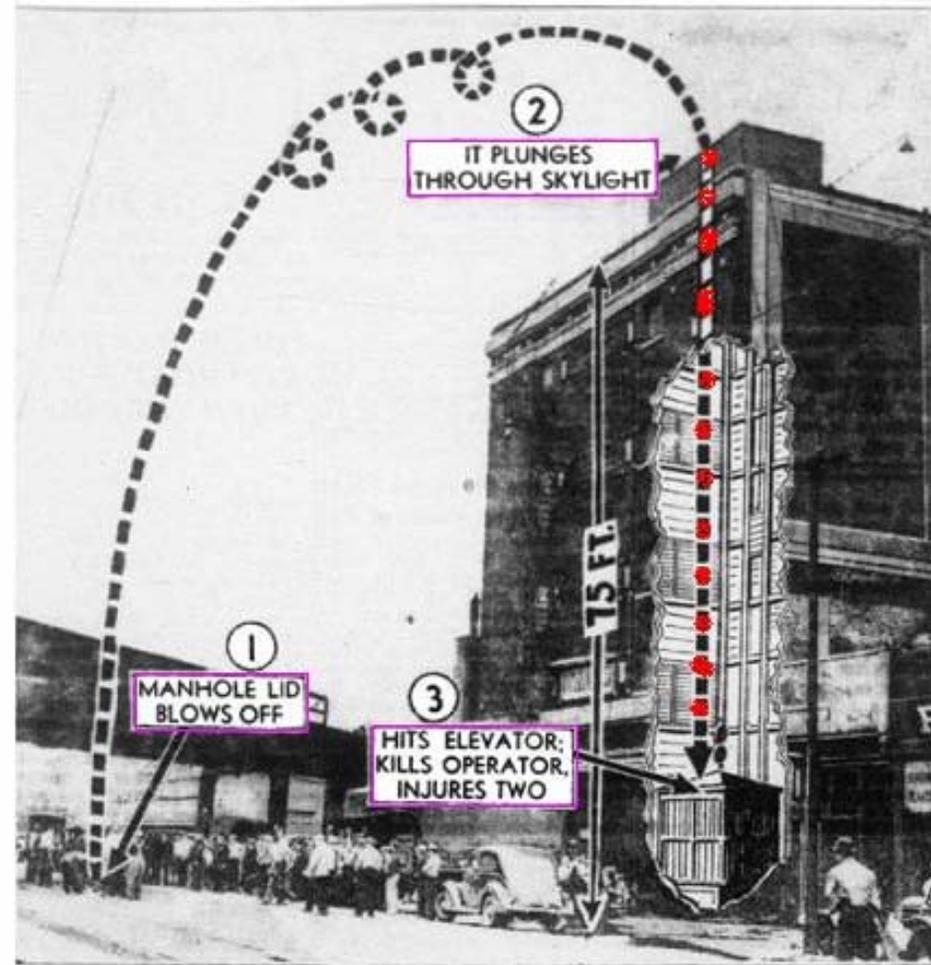
What's the Big Deal???

- Certain bacteria in sewage produce H_2S .
- It is corrosive to metal and concrete.
- Exists in slow flowing, oxygen deprived sewer environments.
- It exists as a dissolved sulfide or as a gas.
- H_2S is heavier than air, so its concentration can increase to toxic and combustible levels.

So Beware

CHICAGO SUNDAY TRIBUNE: MAY 30, 1937

ONE KILLED WHEN BLAST FLIPS MANHOLE COVER



H₂S Prevention and Treatment

- Chemical Injection directly into the sewage
 - Bioxide
- Odor Control Unit
 - Carbon Filter
- Intelligent Design of pipe systems



The Testing

➤ Jerome meter



➤ DO, pH, Conductivity



Air Monitoring Equipment

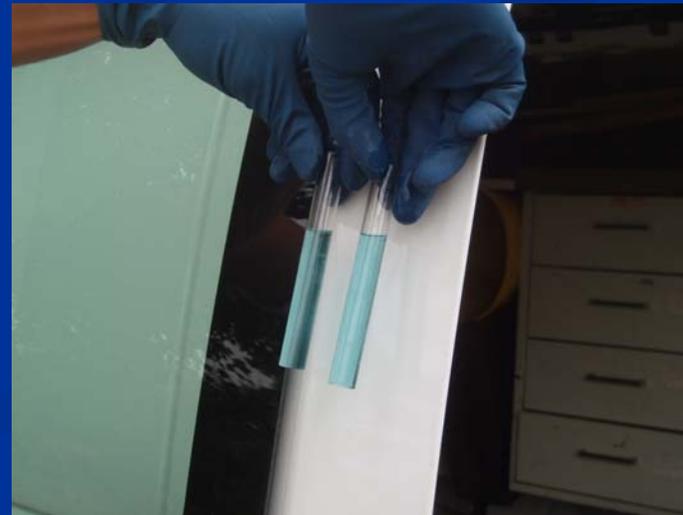
- **TMX 412**
Confined space safety



- **The Oda-Logger**
Long term air monitoring



Dissolved Sulfides



Our mission:

To explore the furthest reaches of the county in our quest for manholes.

To park where we please and fearlessly stand in traffic

To boldly do what nobody else really wants to do

Manhole Locates



Why Are We Finding Manholes?

- The older manholes are 18" in Diameter
- They must be replaced by 24" manholes
- No, it's not because of the ongoing obesity epidemic
- It's so the TV crew can fit their inspection equipment in the sewer



How Did We Find Them

- Handheld GPS
- Metal detector
- GIS maps
- One line maps
- Following our noses



Bushwhacking



What's an easement?

Brian Gets Homesick



It's sunny in Pasadena



Diggin' a Hole!
(the hard way)



OPEN!#*&!

Our Big Disappointment



Uh guys, the manhole is actually over here.

What?!! Lets just stick a cone in it and leave.



I mean, come back to it later.

During Our Adventures We Saw...

The Good



The Bad



And The Ugly



More Adventures Yet to Come...

- TV Crew Inspections
- Even *more* Manhole Locates
- Additional Confined Space Entries

Big Thanks to

- Facilities Inspection team

- Mike Sands

- Sari Duncan

- Darrell Myers

- Lee Miller

- Sarah White

- Abraham Araya

- Bob Isaac