

Reducing Sewer Risk with Real Time Monitoring

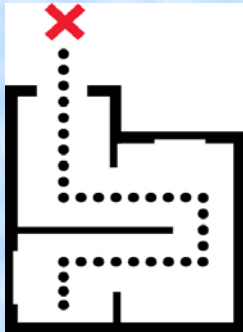


**Justin Hobbs – Hadronex Incorporated
October 27, 2009**

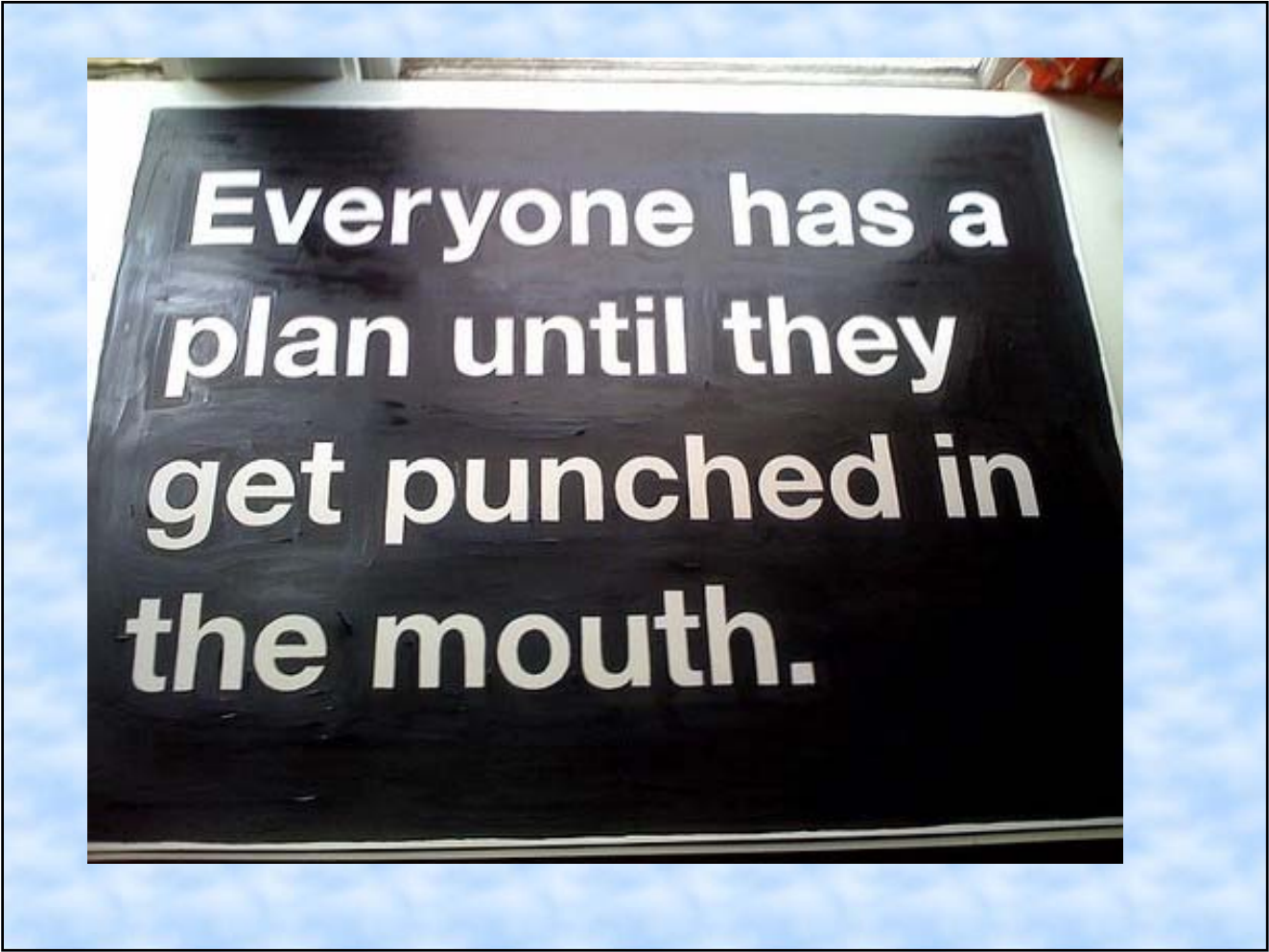
Smart Sewer 2009

The Mission and The Goals

- **Reduce risk, cost and damage from sewer spills**
- Do this at low expense
- Don't increase complexity
- Create a supportable method for the future
- Do this in a timely way



You gotta have a plan....

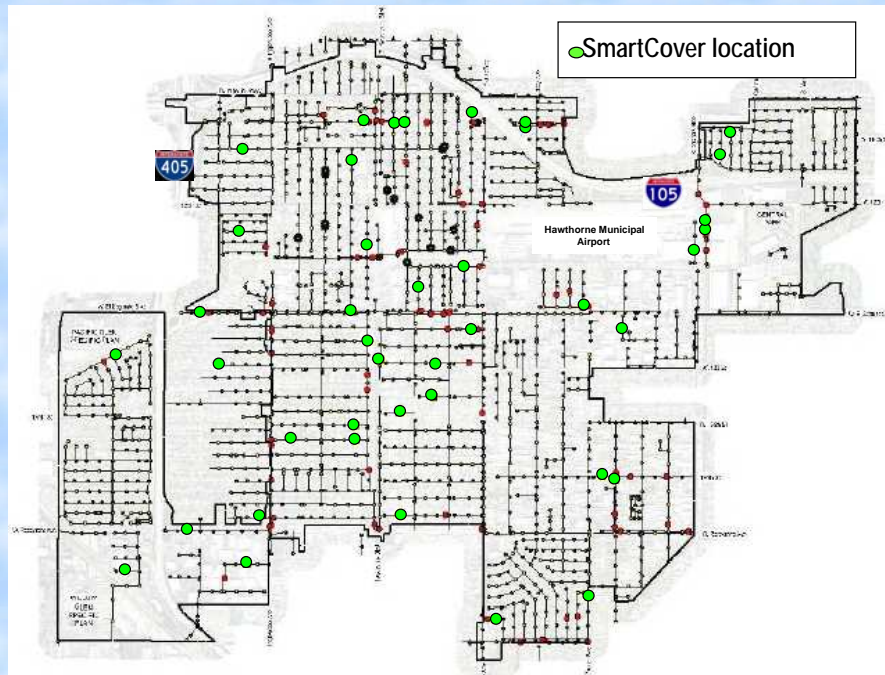
A black rectangular sign with white text is centered against a blue sky background with light clouds. The sign is slightly tilted and has a white border. The text is in a bold, sans-serif font.

**Everyone has a
plan until they
get punched in
the mouth.**

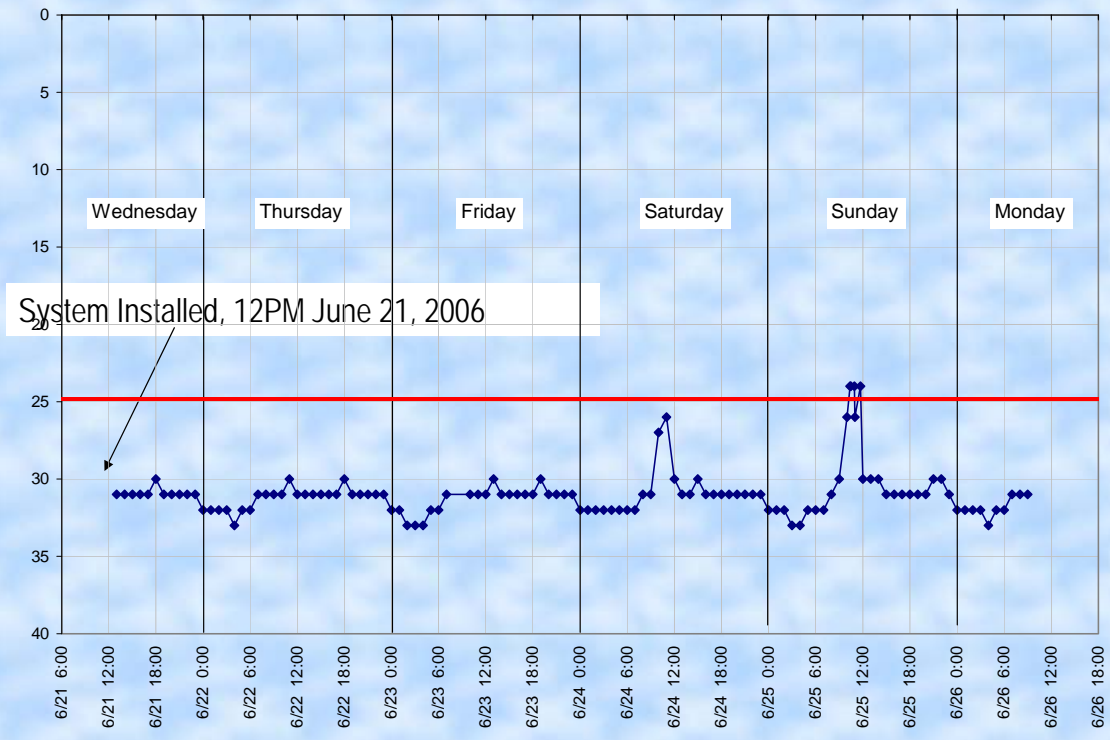
The Sewer Monitoring Challenge

- The damage can be **severe**
- The problems can be **insidious**
- Technology can be complex and **expensive**
- The planning process has many **tradeoffs**

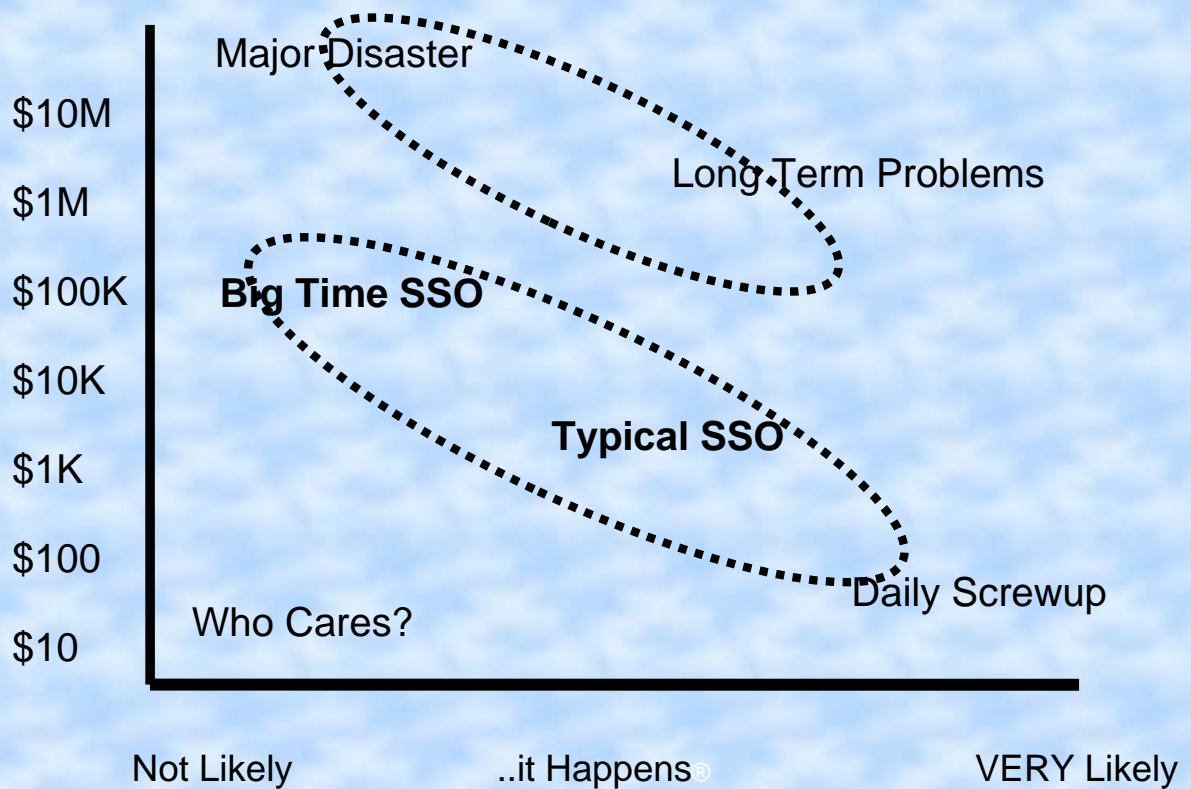
Wastewater System Geography Everything is **Underground**



Mysteries are Discovered

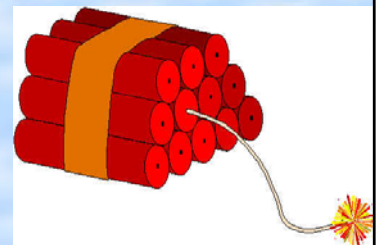


Sewer Risk and Cost



Types of Risk

- Single site impact
- Interruption of local service
- Major user facility impact
- Chronic problems, local
- Chronic problems, wide spread
- Long term, systemic disasters
- Subtle, lifelong annoyances



Types of Costs

- Planned operating expenses
- Unplanned operating expenses
- Major hijack of reserves
- Big time insurance claims and rate increases
- Fines
- Quality of life
- Environmental impact
- Political impact
- Long term capital budget planning



Costs of Sewer Spills

- A central California city – street spill \$5,000
- If it hits a river - \$20,000
- Brown & Caldwell 2005 \$10 per gallon to avoid
- A Southern California city \$100 / gallon small spill
- Fines \$0.10, \$1.00, \$10.00 per gallon



Spill Liabilities

- Purchase of a \$1.5 million dollar house
- State facility cleanup \$200,000
- Mitigating environmental project \$900,000
- Citywide \$900,000 settlement
- EPA says there are 3,500,000 illnesses / year from spilled sewage
- One city had \$2,000,000 in claims per year



Cost Benefit Example

- A remote monitoring system that costs \$3,000 per site to install
- And costs \$900 per year to maintain
- Assume prevents a \$5,000 surcharge every two years
- In 6 years saves over \$6,000 and continues to save \$1,600 per year there after
- 50 such units save \$80,000 per year

The Remote Monitoring Method

- Remotely monitor the **levels** of water in manholes and lift stations
- Use **existing** digital radio technology to gather the data and send commands
- Use web and cell phone based command and display
- Don't install complex SCADA servers or radios
- Put the alarm response **protocol** in place
- Go on **frequent vacations** to nice places

SmartCover Mounting



Installed SmartCover Unit
Magnetic Mount

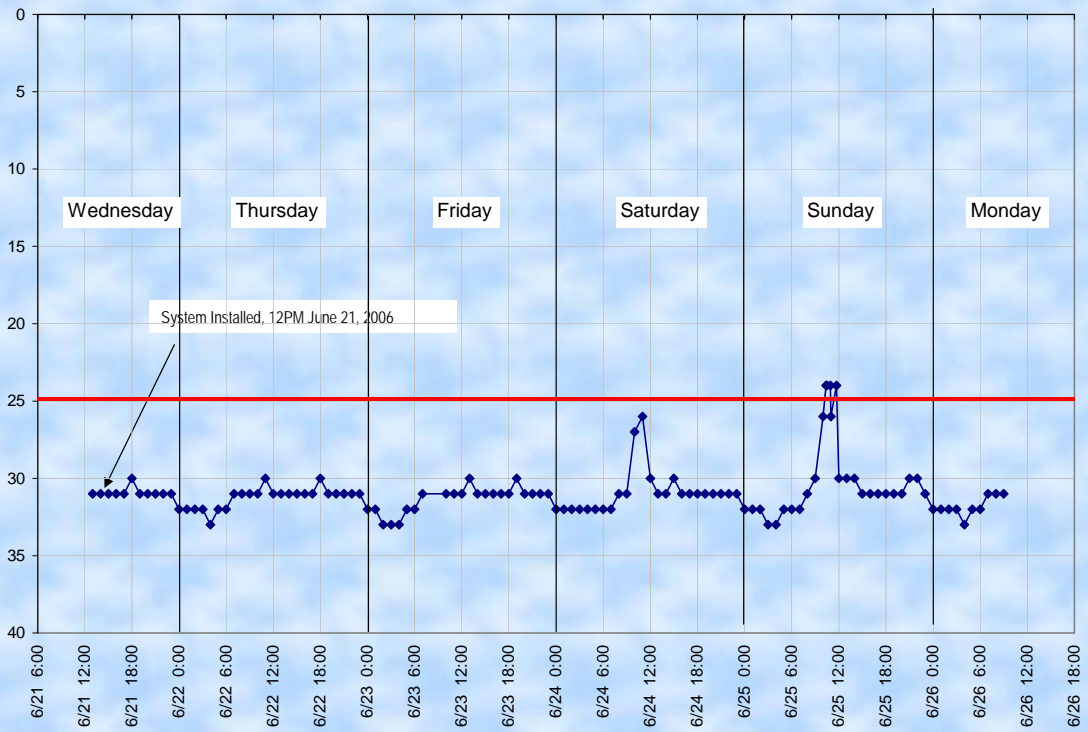


Surface Mounted Antenna



Mounting and Installation are simple
**** NO CONFINED SPACE ENTRY ****

The Siphon Mystery - Solved



Smart Cover Distance Readings - Microsemi and 87th

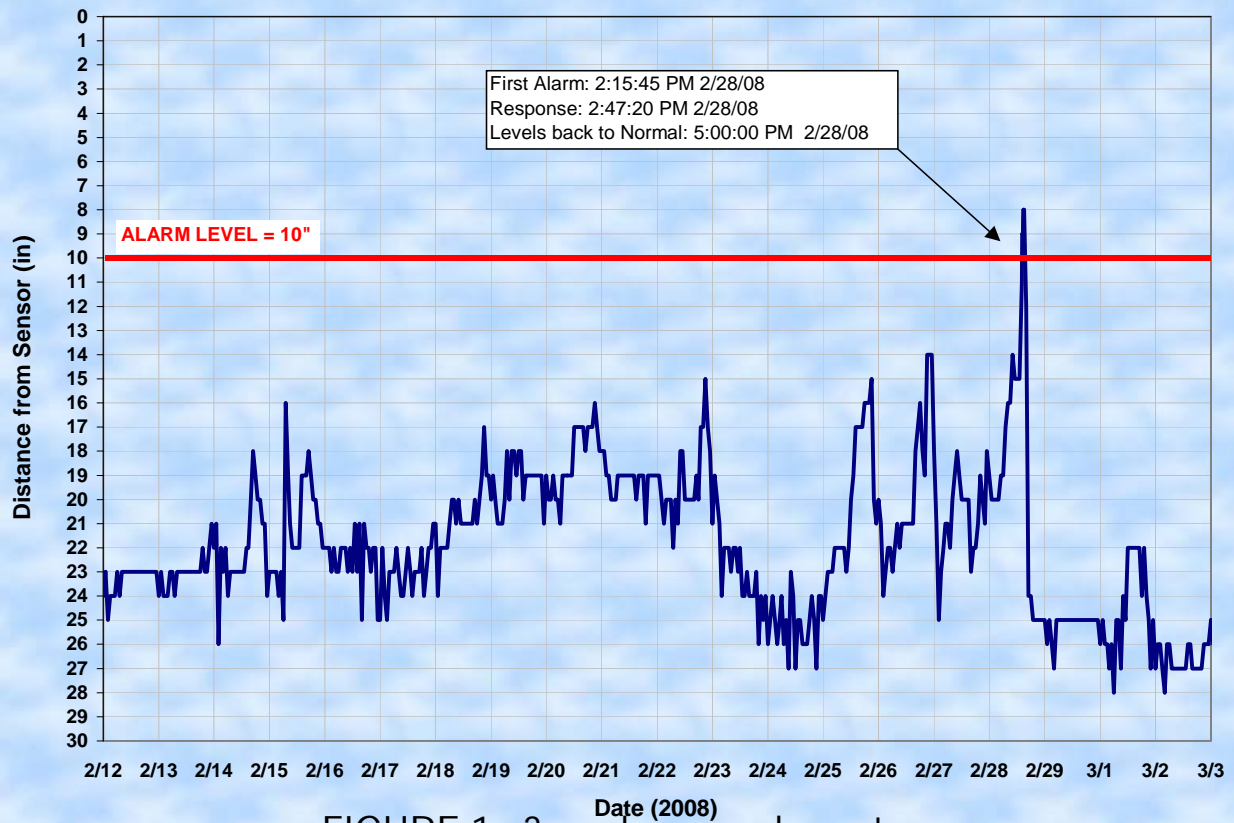


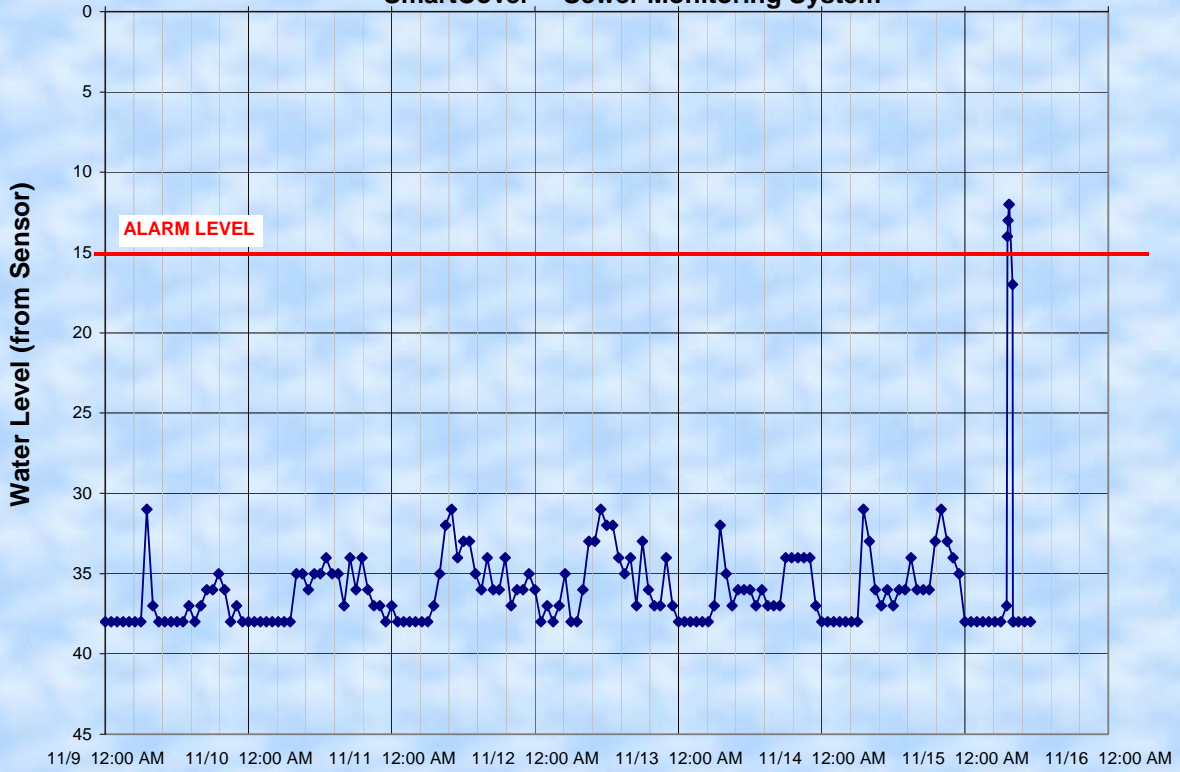
FIGURE 1: 3 weeks around event

City of Hawthorne

SmartCover™ Sewer Monitoring System

Water Levels
11/9/06 to 11/16/06

4447 116th Street



Real World Results

- 813 Spills avoided – about 0.6 per year per site
- 23 unauthorized Intrusions detected, several apprehensions of **dirt bags**
- 6 million hours of field operations
- Some monitoring sites paid for in lieu of fines (Supplemental Environmental Projects)
- Hawthorne, CA went from a spill per month to zero spills in three years

SmartCover[®] Web Map Interface

City of Hawthorne

SMARTCOVER™ MONITORING SYSTEM

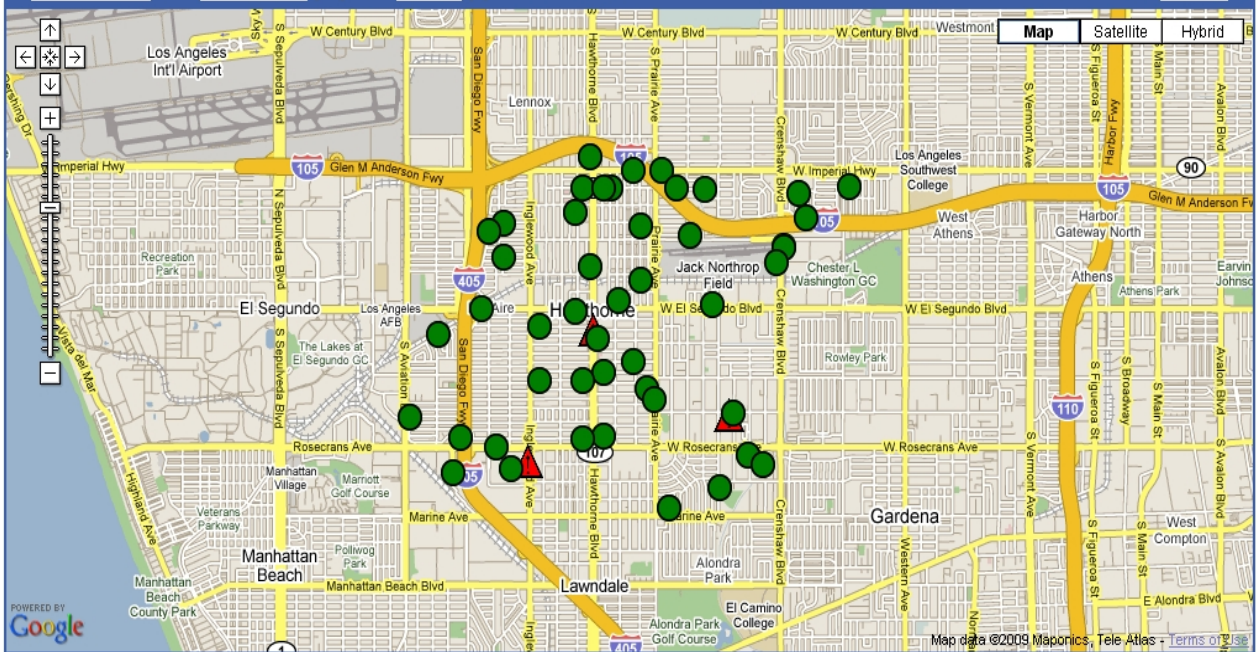
You are logged in as: hadronex

Classic View

All Sensors (50)

Alarms (3)

Logout



Where do you monitor?

- Known problem locations from your records
- All lift stations, even if already instrumented
- Places of high impact if sewer service is interrupted
- Boundary sites between agencies
- At between 2 to 5% of all manholes
- Risky sites with aging equipment
- Long, flat lines

The Plan...

- Assess risks and costs for your agency
- Prioritize, survey and inventory
- Add to SSMP
- Deploy **SmartCover**[®] monitoring
- Put the response protocol in place
- Think minutes not hours
- Avoid a MESS of costs



The End

Hadronex Inc. 760-291-1980 www.mysmartcover.com