

Pinpointing I&I down  
to Adjacent Manholes



# I&I Micro Detection

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## **iTracking® Micro Detection is based on a simple premise:**

**What municipalities and utilities are ultimately interested in accomplishing is NOT to measure each gallon of I&I but to quickly and cost-efficiently PINPOINT those areas within the collection network responsible for contributing the greatest influx of rain and groundwater.**

This is exactly what Eastech's iTracking Micro Detection technology is designed to achieve; locate inflow and infiltration down to adjacent manholes simply, safely, quickly and affordably.

Hundreds of independent flow studies have confirmed that 80% of I&I resides in just 20% of the collection network. It is in this 20% of the system that I&I needs to be discovered. Conventional Doppler-type flow meters, while able to measure flows in larger basins (2-4 miles) where wastewater levels remain at heights satisfactory for covering their "bottom-sitting" sensors, have proven themselves incapable of providing the necessary high resolution monitoring required for micro detecting I&I in the smaller diameter pipes (8"-12") that make up 85% of almost every collection system. This shortcoming presented Eastech with an opportunity for developing a solution not currently possible with conventional flow metering devices.

The key to iTracking Micro Detection is the seamless integration of low-cost sensors, wireless connectivity and automated analytical software, delivering results where portable flow meters fall short. iTracker® Wi-Fi and cellular-enabled sensors simply and safely record wastewater levels from 0 – 100% pipe ID during dry day periods and wet weather events and then convert those changes in level to volumetric differences in flow through the use of uniquely developed algorithms embedded within the iTracking software program. With the simple click of a button, bar charts, line graphs and operating performance reports are clearly presented detailing the contribution of I&I for each mini and micro-basin within the area under investigation. In many instances, the problem is pinpointed down to adjacent manholes without the requirement for expensive monitoring equipment, confined-space entry, repetitive maintenance or "in the road" data retrieval.

**The success or failure of attempts to determine the actual location of I&I does not depend on the length of the sewer evaluation study period but rather on the investigative ability of the detection method employed. With iTracking Micro Detection technology, the time period to pinpoint faulty infrastructure could be as short as one rain event. This single storm approach is the biggest factor in delivering a successful and cost saving I&I detection study.**

## iTracking® Micro Detection has the ability to reveal the location of I&I after a single storm event

- Low-cost iTracker sensors provide the high-resolution data points required for pinpointing the 20% of faulty infrastructure contributing the majority of I&I.
- By strategically placing iTracker sensors upstream of regional flow meters, changes in wastewater volume as small as 1/10" can be observed in both mini and micro-basins.
- Maintenance-free iTracker sensors are capable of accurately measuring collection system performance on streets with minimal amounts of homes or commercial facilities.
- iTracker sensors are installed from the street level without the need for confined-space entry. Sensor calibration is accomplished in 5 minutes using any Wi-Fi enabled mobile device.

### iTracking® Bridges the Gap between Flow Meters and Inspection Cameras



In most instances, **after just a single storm event**, the problem is pinpointed down to mini and micro basins without the requirement for expensive monitoring equipment, confined-space entry, repetitive maintenance or "in the road" data retrieval. This single storm approach is the main factor when it comes to delivering a successful and cost effective I&I detection study.

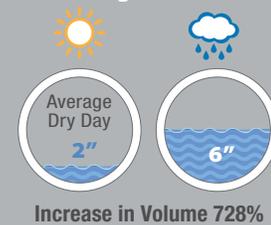
## How iTracking® Works

iTracker® Wi-Fi or cellular-enabled sensors simply and safely record wastewater levels from 0–100% pipe ID during dry day periods and wet weather events and then convert those changes in level to volumetric differences in flow through the use of uniquely developed algorithms embedded within the iTracking software program.

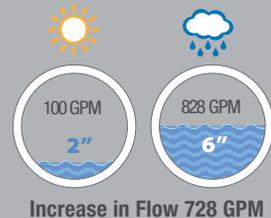
### iTrackers® monitor and record levels within the manhole



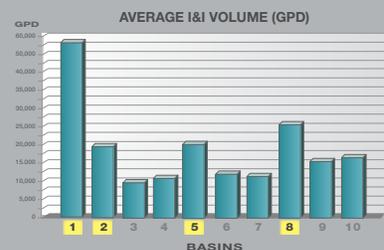
### Smart algorithms convert changes in level to changes in volume



### iTracking analytics convert changes in volume to flow in gallons per minute



### Software identifies mini/micro basins with the greatest amounts of I&I



With the simple click of a button, bar charts, line graphs and operating performance reports are clearly presented detailing the contribution of I&I for each mini and micro basin under investigation.

# I&I Micro Detection



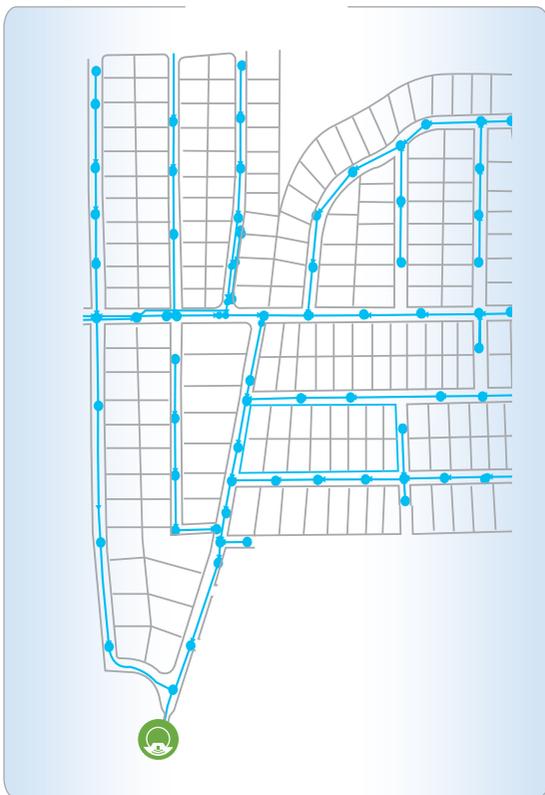
## Flow Meter (Major Basin Monitoring)

Portable flow meters monitor operating conditions in major basins (2-4 linear miles) in order to discover the extent of inflow and infiltration.



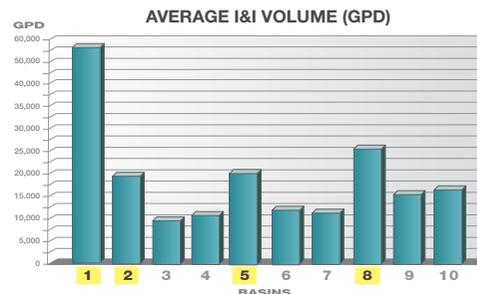
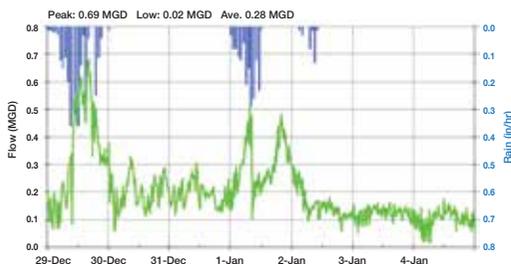
## iTracking (Mini Basin I&I Detection)

iTracker sensors are strategically distributed within each major basin responsible for allowing the entry of excess volumes of ground and storm water.



Hydrographs are then created for each Major Basin showing increases in wastewater volume during periods of wet weather.

“At a glance” iTracking analytics automatically identify the mini basins (1, 2, 5 & 8) responsible for contributing the highest percentages of I&I.



# Zeroing in on the problem

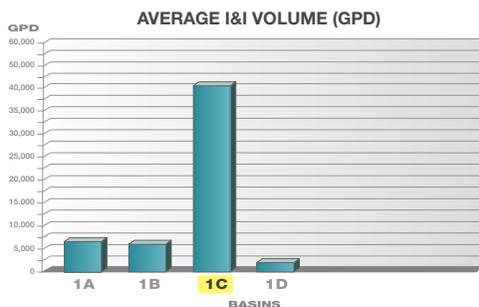


## iTracking (Micro Basin I&I Detection)

Having discovered that mini basin 1 is responsible for 30% of total I&I, iTracker sensors are relocated creating (4) micro basins within mini basin 1.

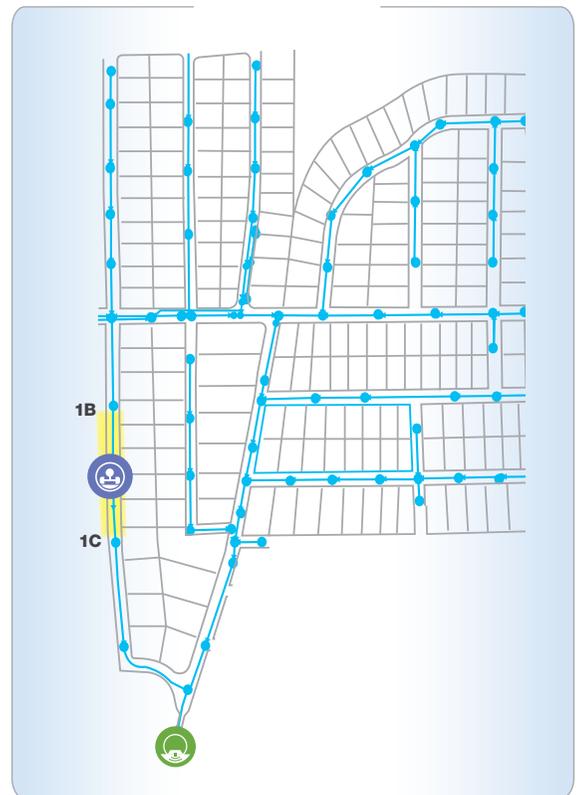


iTracking analytics immediately discover that micro basin 1C, comprised of adjacent manholes 1B - 1C, is contributing 75% of the I&I within all of mini basin 1.



## Camera (I&I Confirmation)

A robotic inspection camera is employed to ascertain the exact cause of the Rain-Derived Inflow & Infiltration (RDII) entering micro basin 1C.



Robotic cameras are capable of providing visual evidence as to whether I&I is due to faulty construction, crumbling pipes or improper installation.



# Advanced Technology

## The Simpler the Better

Non-confined space iTracker installation is accomplished in 15 min.



Non-contact iTracker ultrasonic sensors are maintenance-free.

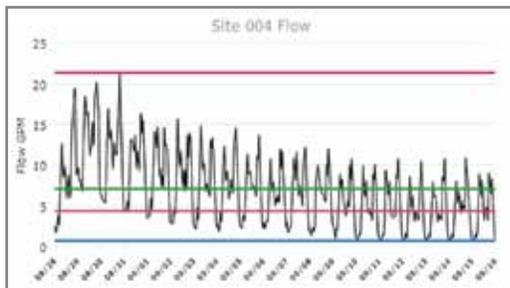
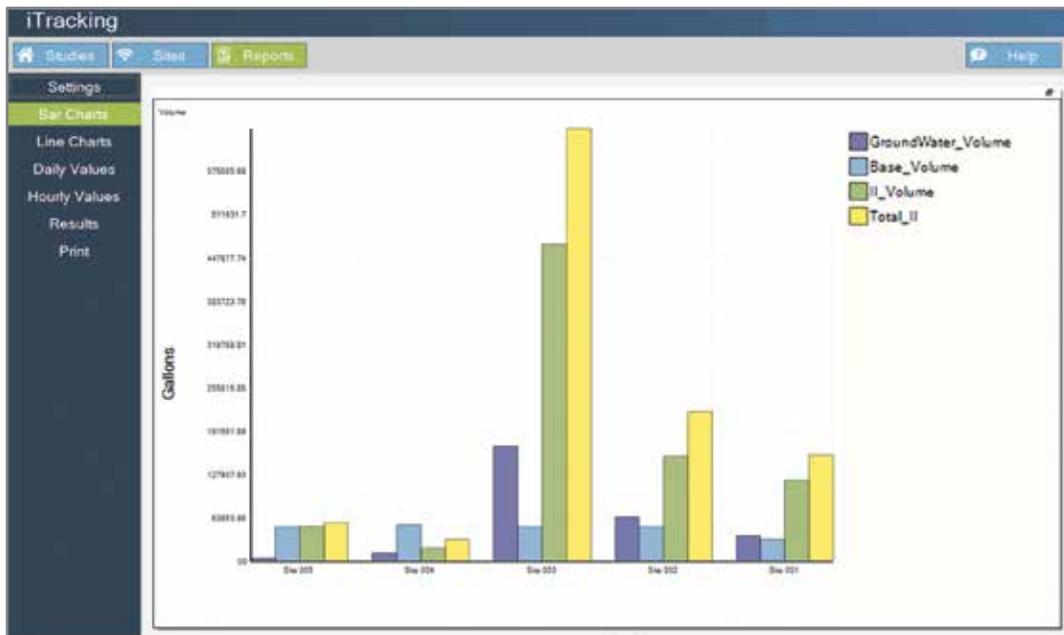


Wi-Fi and cellular iTrackers allow for safe data retrieval.



## Results At A Glance

Simple to understand bar charts, line graphs and consolidated reports depict “at a glance” mini and micro basins responsible for contributing the greatest amounts of I&I. By presenting all of the results within a single chart, the most problematic sites are immediately identifiable.



Station	GroundWater_Volume	Base_Volume	I1_Volume	Di_Totals_Volume	I&I_Volume
Site 001	5,229.79 gal	45,412.00 gal	54,204.30 gal	52,641.78 gal	103,846.10 gal
Site 004	13,158.84 gal	01,570.00 gal	25,190.98 gal	40,020.43 gal	95,107.81 gal
Site 002	188,867.00 gal	45,412.00 gal	832,182.20 gal	217,399.50 gal	700,000.10 gal
Site 003	68,020.10 gal	45,412.00 gal	160,943.80 gal	114,227.80 gal	279,890.30 gal
Site 005	37,917.50 gal	31,122.00 gal	180,261.47 gal	89,239.34 gal	187,343.02 gal

To learn more about I&I Micro Detection and how it can cost-effectively locate I&I down to a pair of adjacent manholes, please contact us directly at 1-800-226-3569 or visit:

[smartwastewater.com](http://smartwastewater.com)



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