Miami-Dade Water and Sewer Department's Comprehensive Lateral Investigation Program (CLIP)

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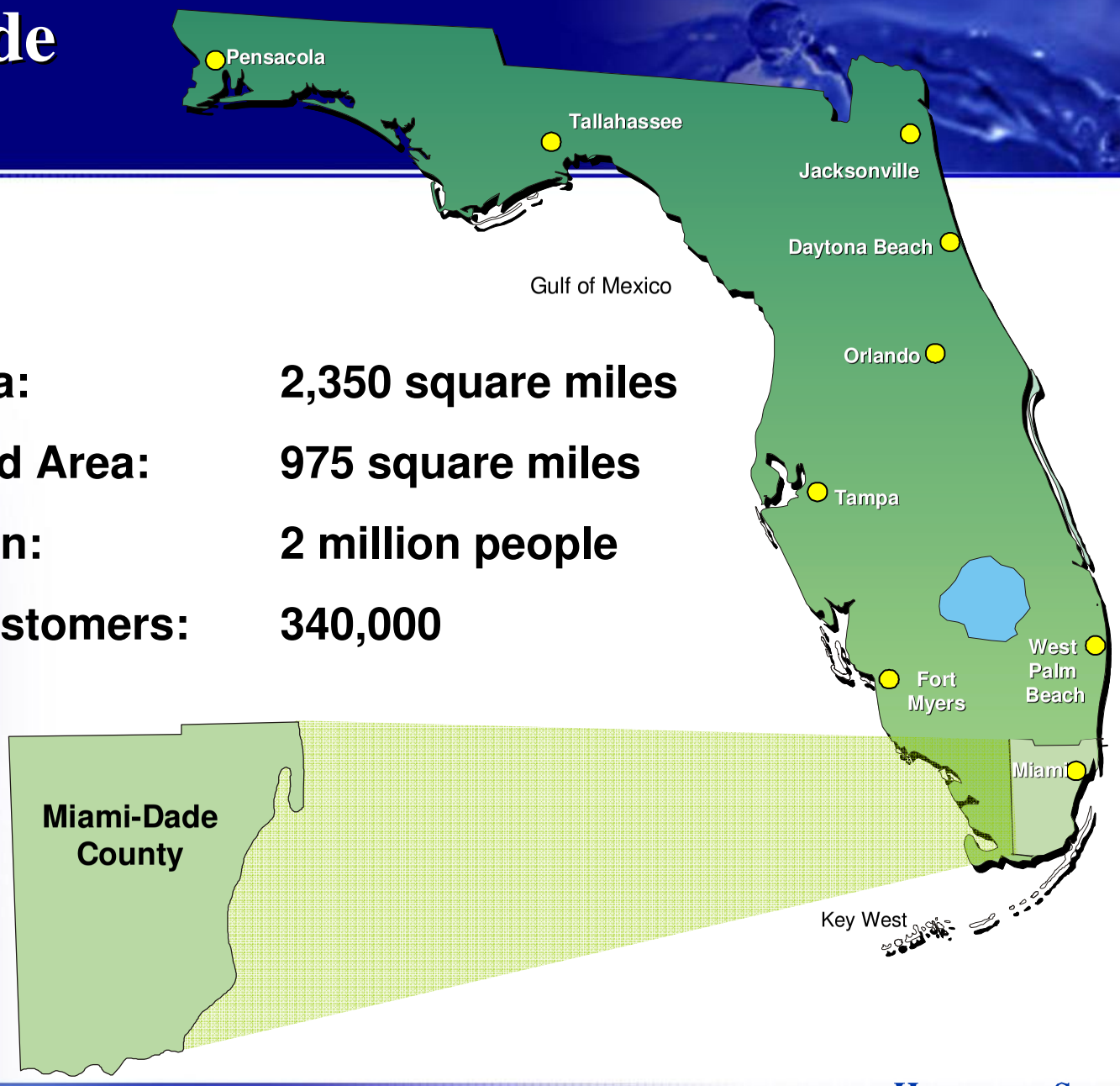
Miami-Dade County



Total Area:	**2,350 square miles**
Developed Area:	**975 square miles**
Population:	**2 million people**
Sewer Customers:	**340,000**

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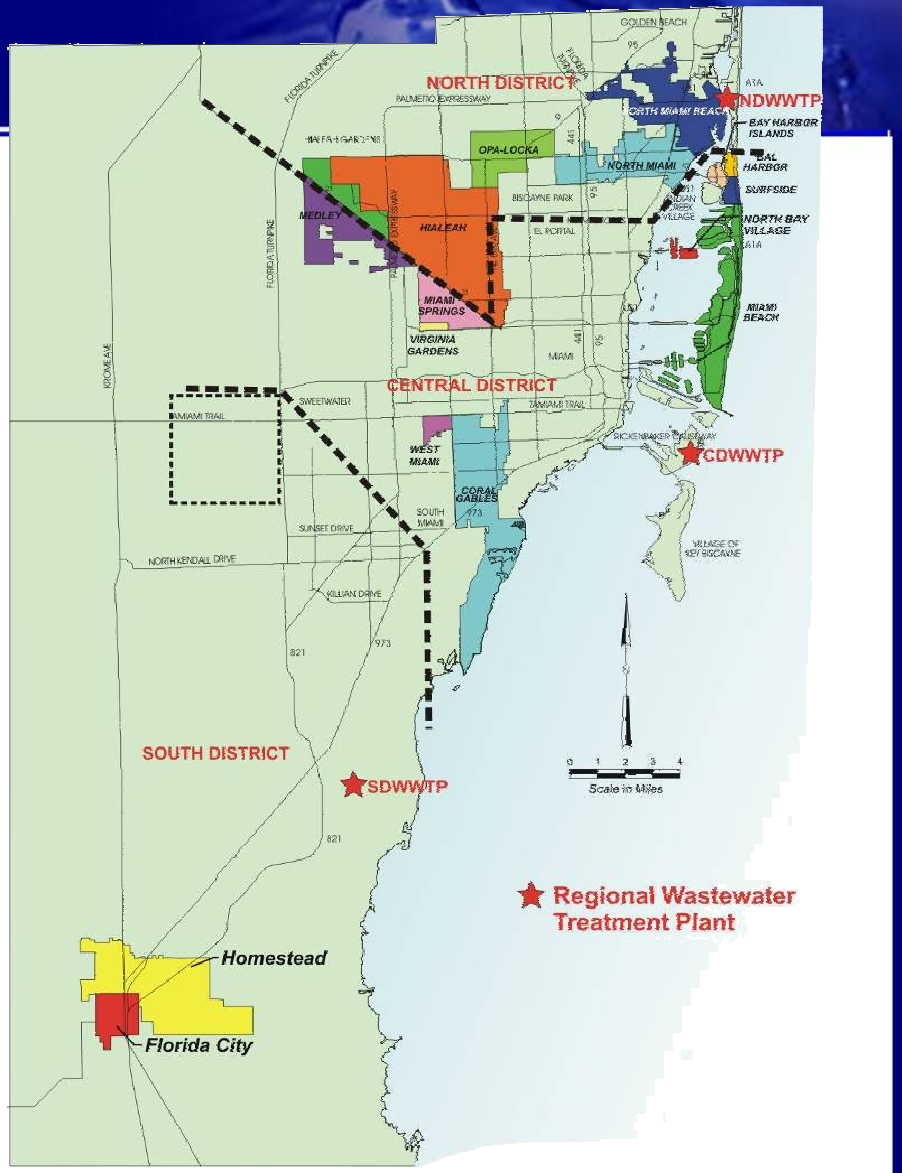
Miami-Dade County Collection System

- 3 regional treatment plants
- 3,724 miles of sewers
- 978 pump stations
- 325 mgd ADF to regional WWTP's (1995)
  - 70% WASD
  - 30% wholesale customers



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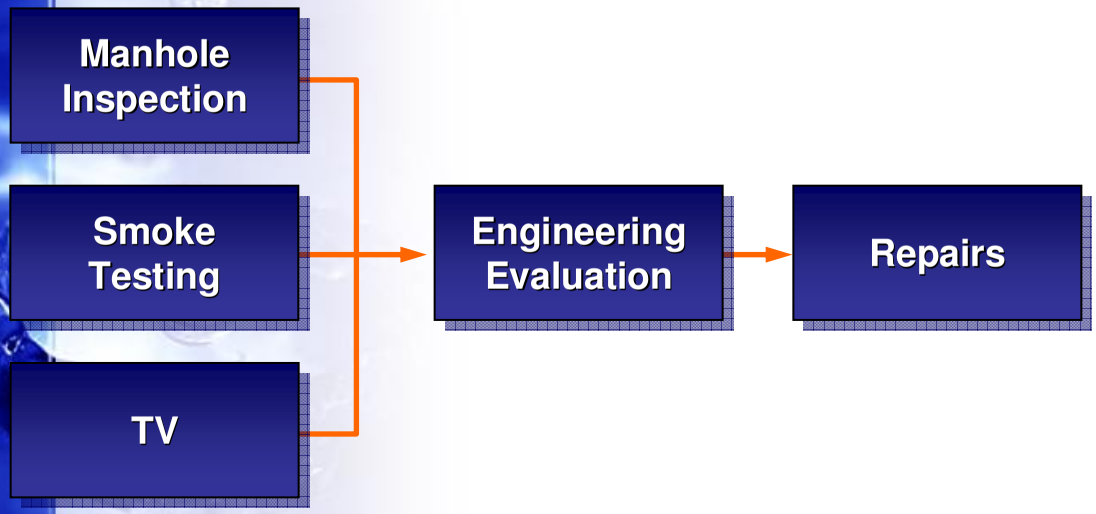
I/I Program Work Flow Diagram

- 68,720 manholes inspected
- 20 million feet televised and smoke tested
- 43,853 defects identified
- 39,001 repairs completed



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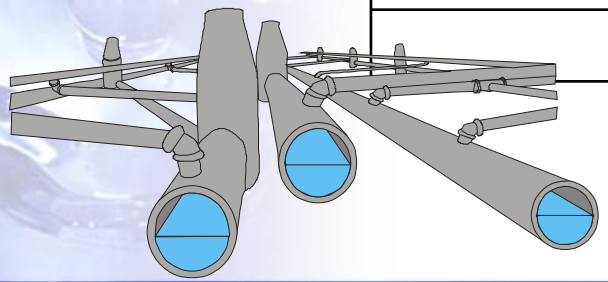
Rehabilitation program summary

Rehabilitation Type	Identified
Line Replacement	2,010
Fold and Form Liner	4,285
Cured In Place Liner	3,565
Main Line Point Repairs	3,809
Lateral Point Repairs	4,861
Robotic Repairs	2,292
Sectional Liners	5,106
Clean, Test, and Seal	14,681
Manhole Repairs	3,244
Total	43,853



All items repaired

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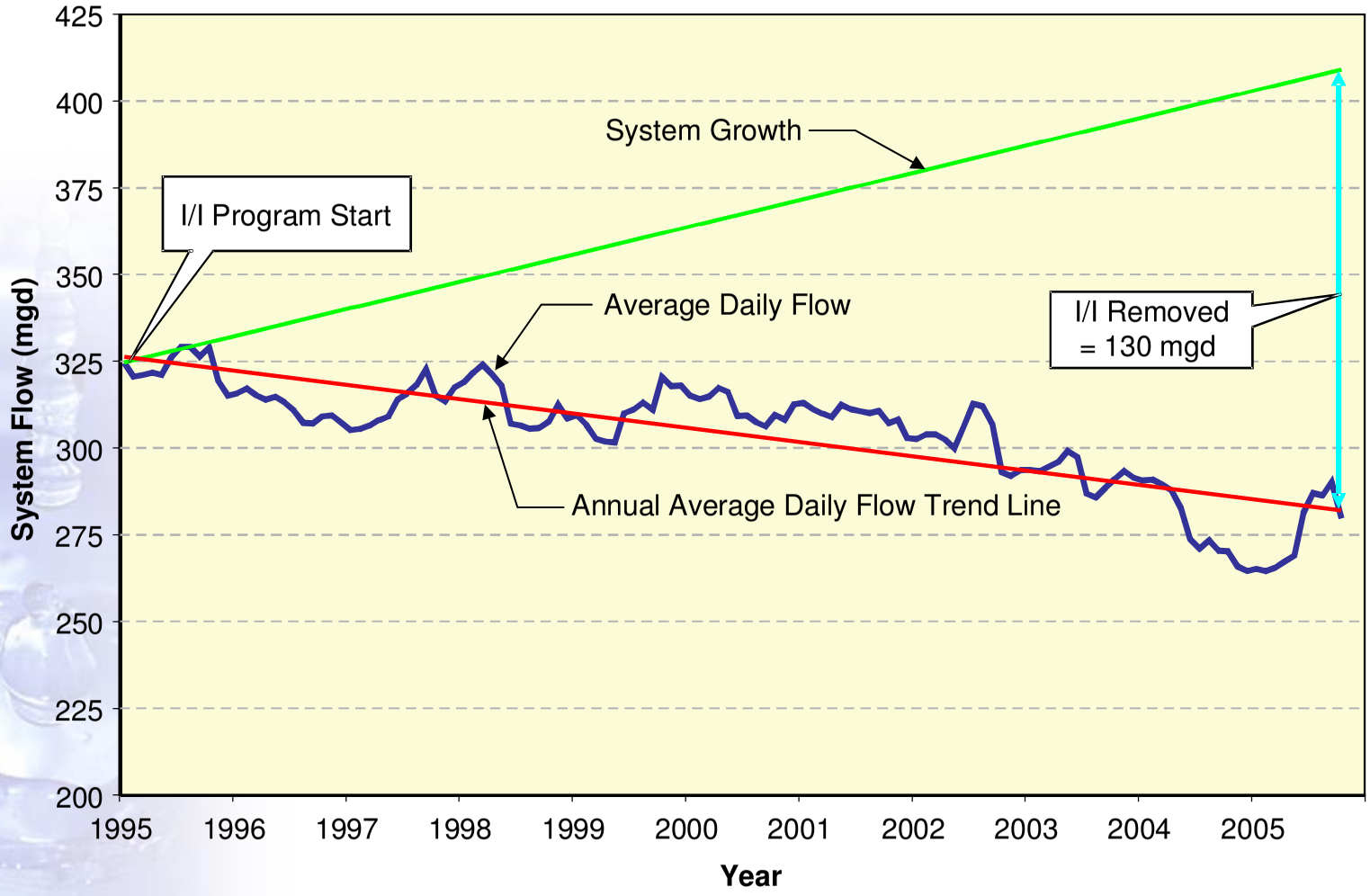
I/I Program Results



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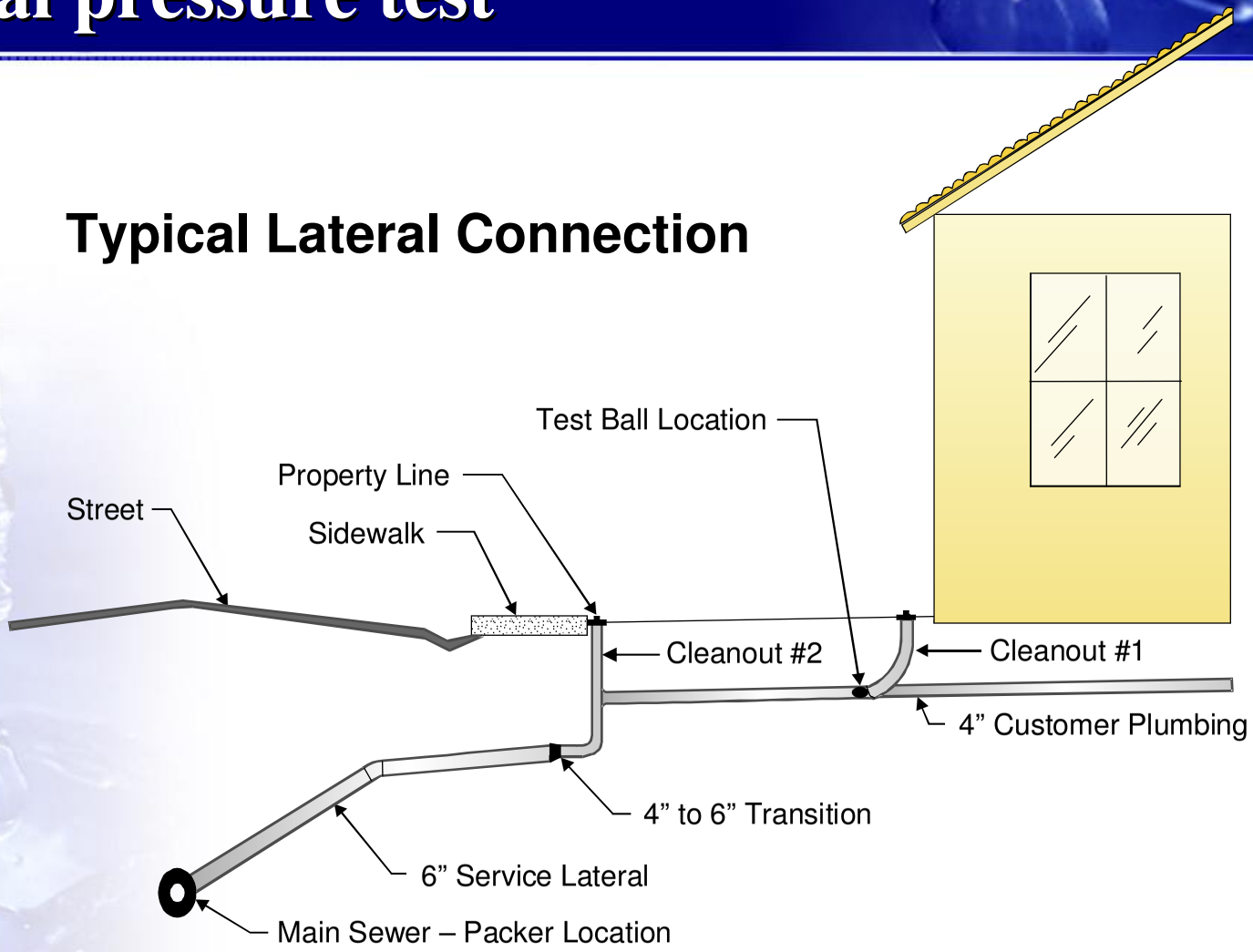
Lateral pressure test



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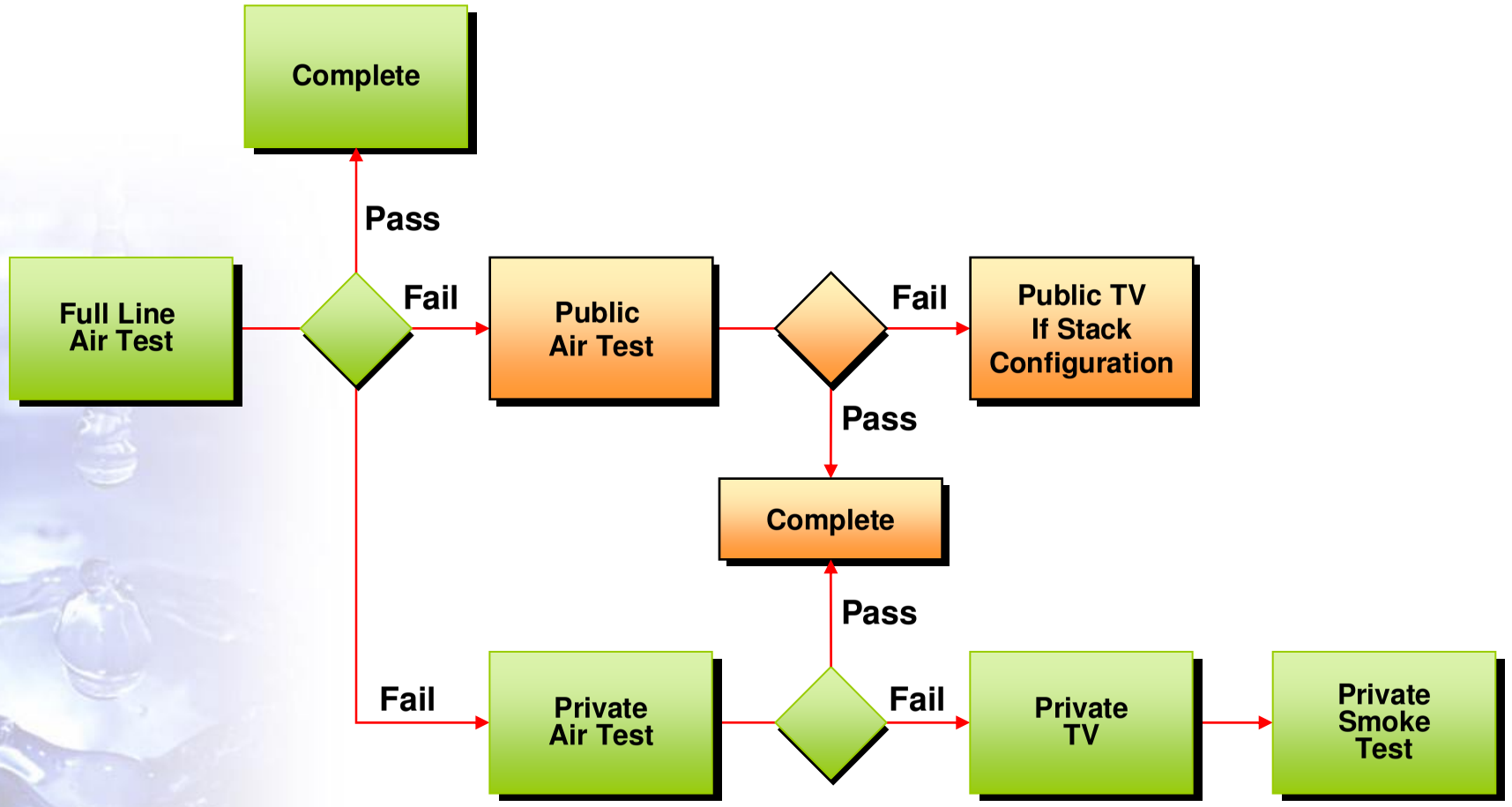
Lateral Inspection Protocol Flow Chart



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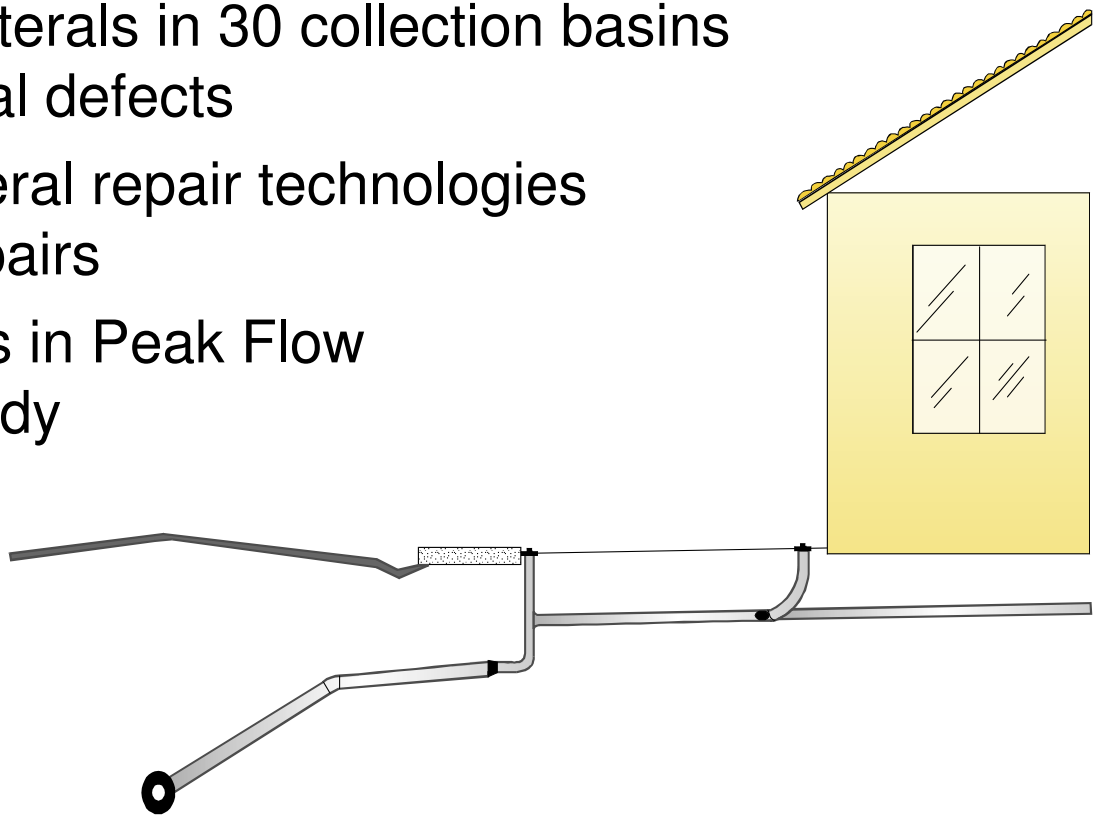
Lateral Pilot Program Purpose

- To determine effectiveness of CLIP at reducing peak flows
- To test service laterals in 30 collection basins and identify lateral defects
- To determine lateral repair technologies and complete repairs
- To include results in Peak Flow Management Study
- To provide a model program for other utilities



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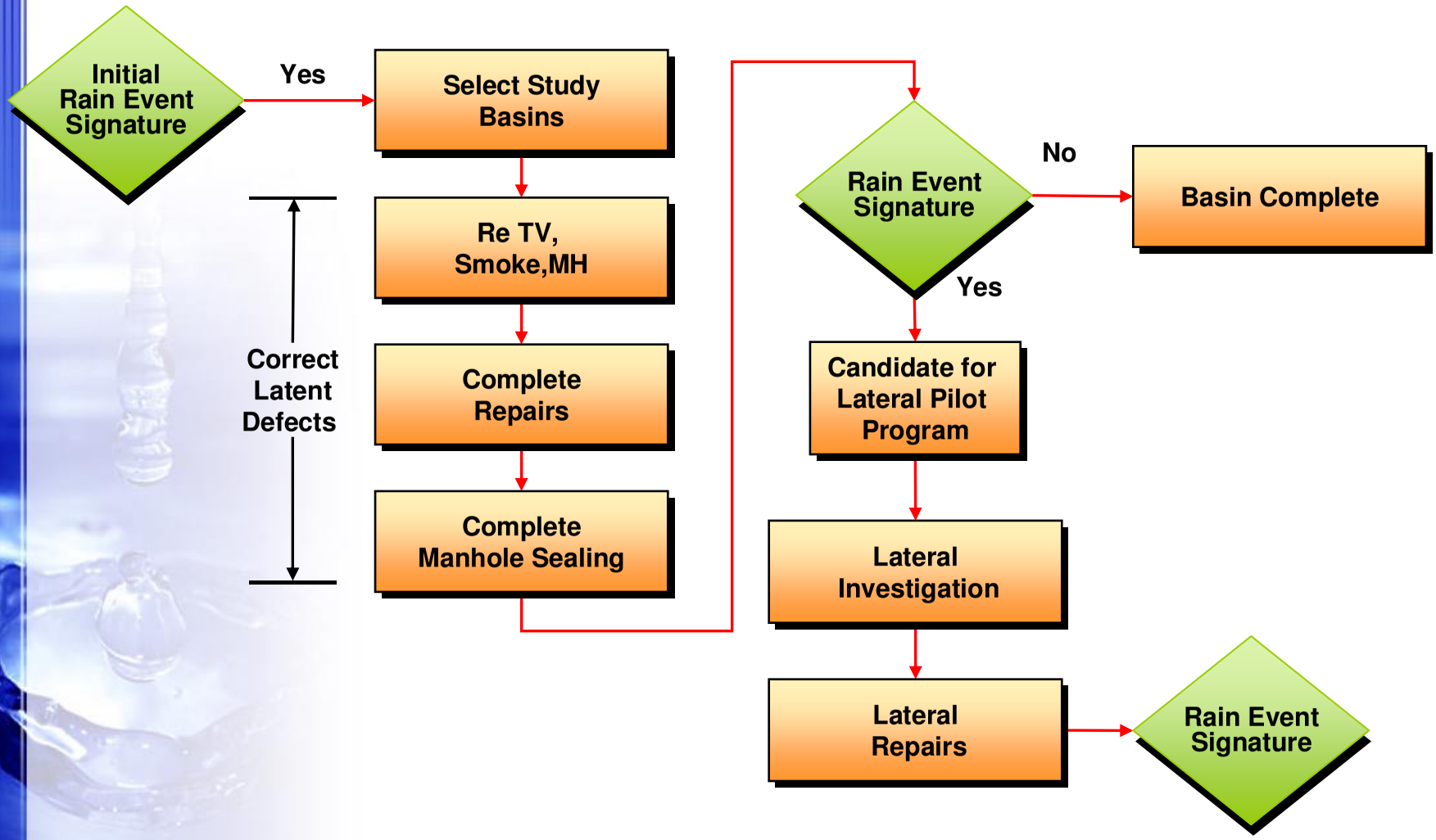
Lateral Pilot Program Protocol



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Basin Selection Criteria

- RDII signature
- < 15, 000 ft of sewers
- Terminal basins
- Constant speed pumps
- Discharge to gravity

Total of 52 stations selected for Program

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Data Collected on Selected Basins

- Land use
- Repair status
- Materials
- Location in County
- Proximity to surface water
- Development potential
- Soil conditions

Purpose – Collect data on cross-section of basins

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Public Outreach Program

Description	No. of Letters	% of Total Letters Distributed
Total notification letters distributed	**9,202**	**100%**
YES – Responses granting property access	**6,291**	**68.4%**
1st Tier	6,173	
2nd Tier	1,542	
Direct	118	
NO – Responses denying property access	**252**	**2.7%**
1st Tier	148	
2nd Tier	202	
Direct	105	
Total responses	**6,543**	**71.1%**
Pending responses	**2,659**	**28.9%**

Approximately 96% of responses were positive

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Inspection Specification – Unit Price Items

Item	Description	Variable
1 – 6	Expose / reinstate lateral	Depth, surface
7 – 12	New / replacement cleanout	Depth, surface
13	Packer installation	
14	Install test plug	
15	Install test plug with rod	
16	Surface air test	
17	Packer air test	
18	Smoke test	
19	Hydrostatic test	
20 – 23	Cleaning	Location, distance
23 – 27	Video inspection	Location, distance
28 – 30	By pass pumping	Size
31	Easement work	

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Summary of Test Results

Lines Tested	Number	Percent
Laterals Tested	6,861	100.0%
Public Side		
Pass	4,341	64%
Fail	1,791	27%
CND	601	9%
Private Side		
Pass	3,768	55%
Fail	649	10%
CND	2,059	30%
N/A	385	6%

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Repair Specification – Unit Price Items

Group A Excavated point repairs and lateral replacement

Group B Cured-in-place (CIP) liners

Group C CIP mainline / lateral repair system

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Lateral Repair Assignments

Item	Number
Dig and Replace (MSWASD)	971
Cured-In-Place (METRO/ESG)	97
CIP Mainline (METRO/LINK)	102
CIP Liner (METRO/TRIPLEX)	52
Total Items to Repair	1,222

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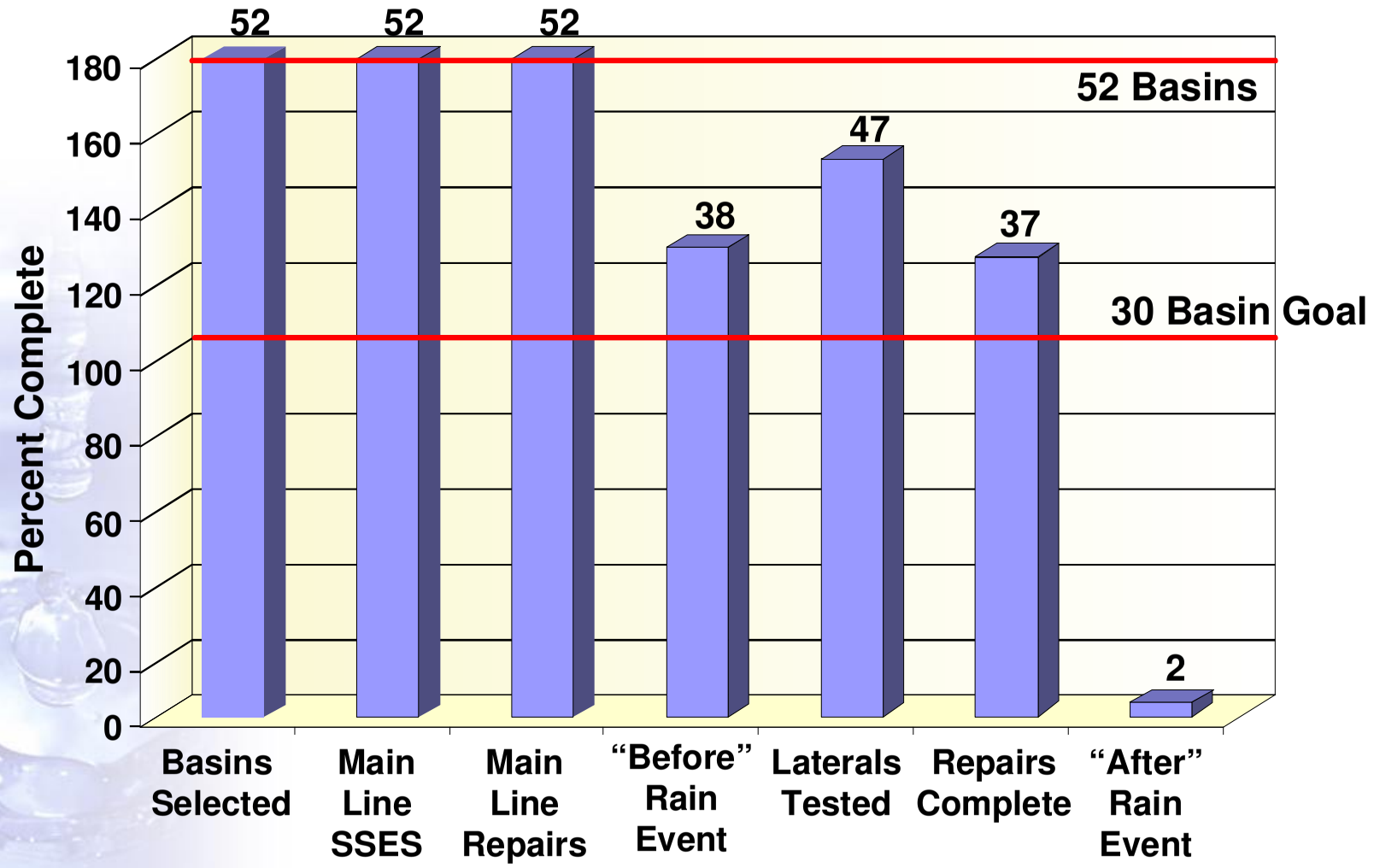
Lateral Pilot Program Status



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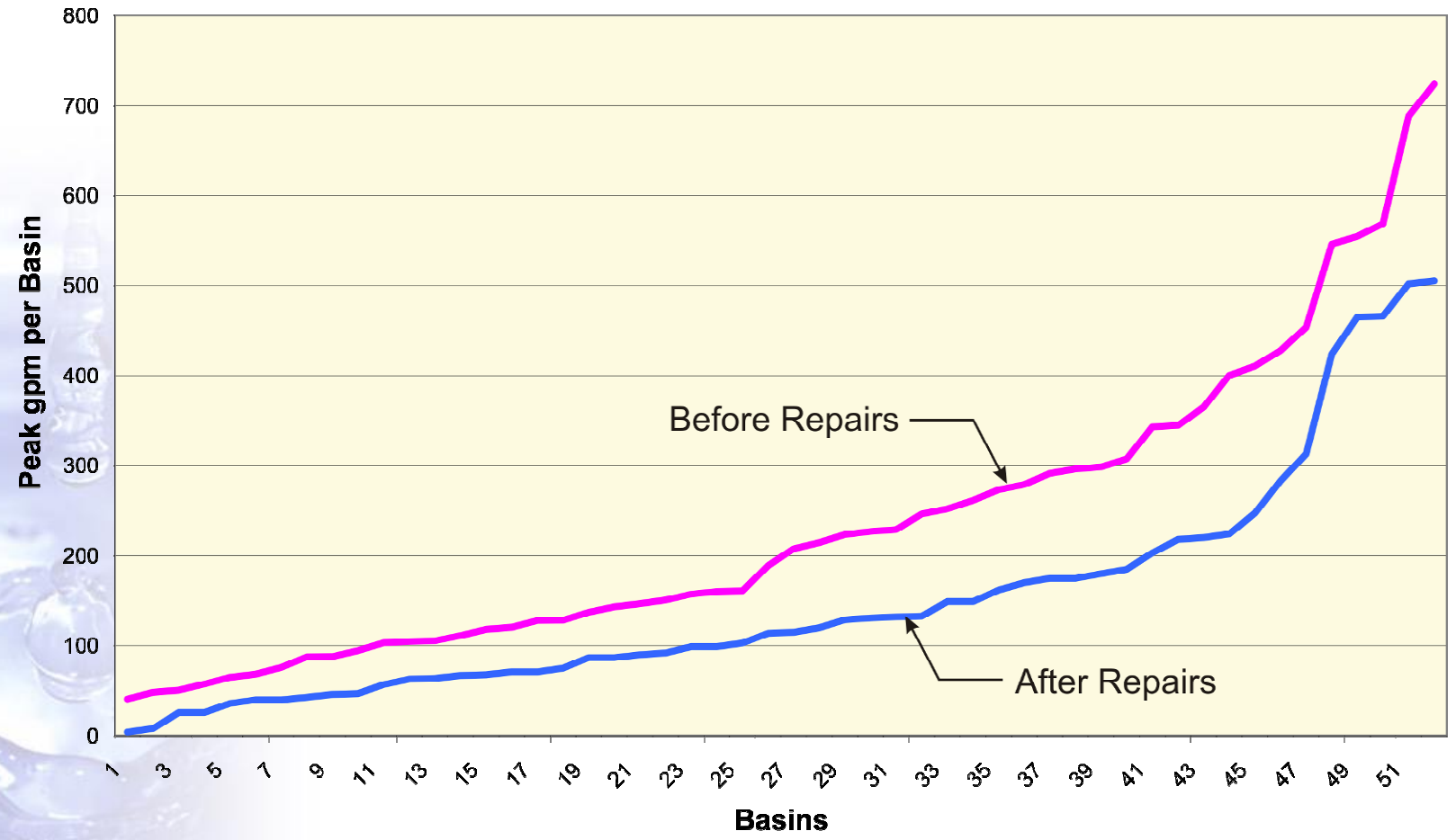
Basin Mainline GPM Reduction



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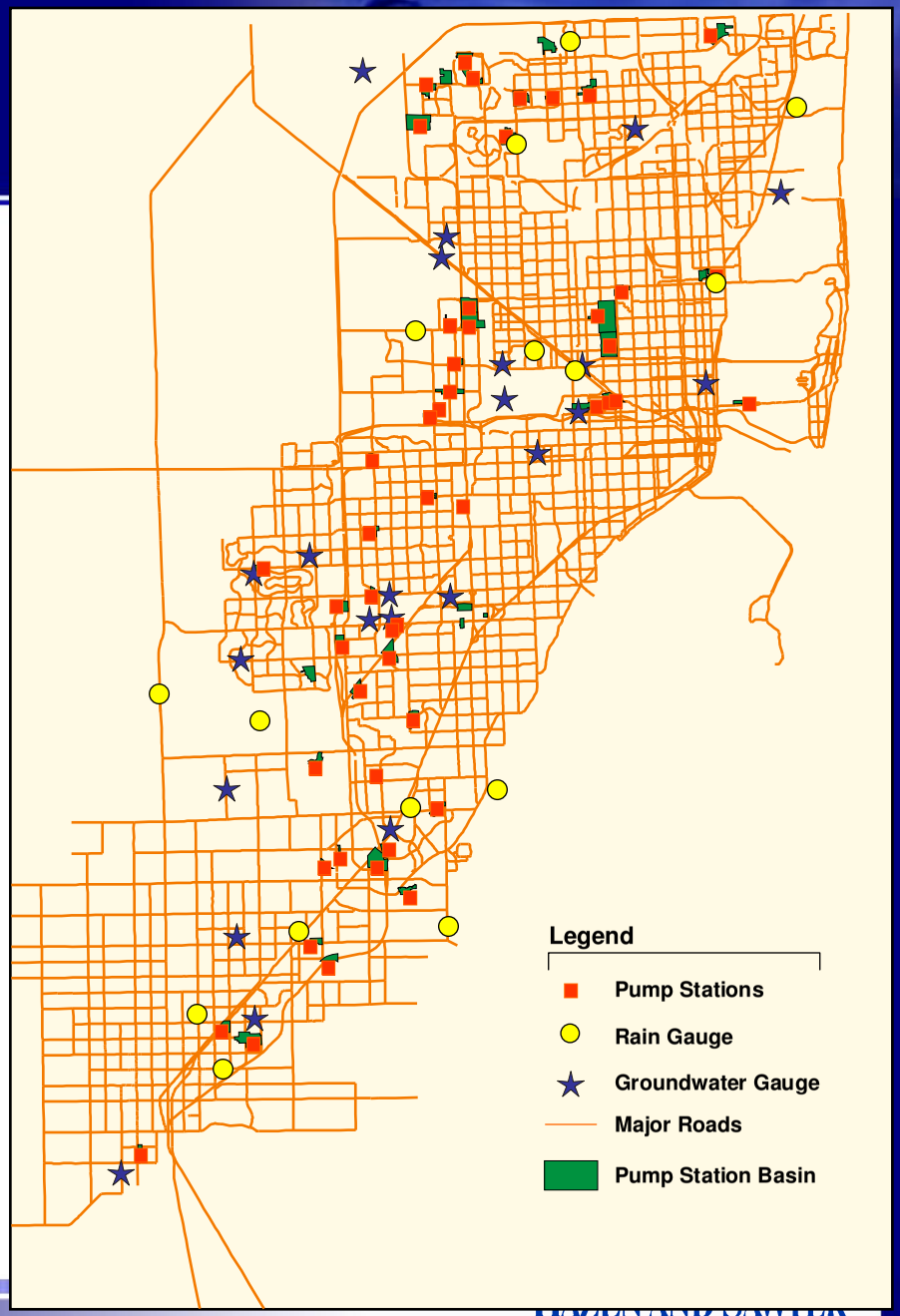
Pilot Station Locations

- Basin Locations (52)
- Rain Gauges (15)
- Ground Water Gauges (23)



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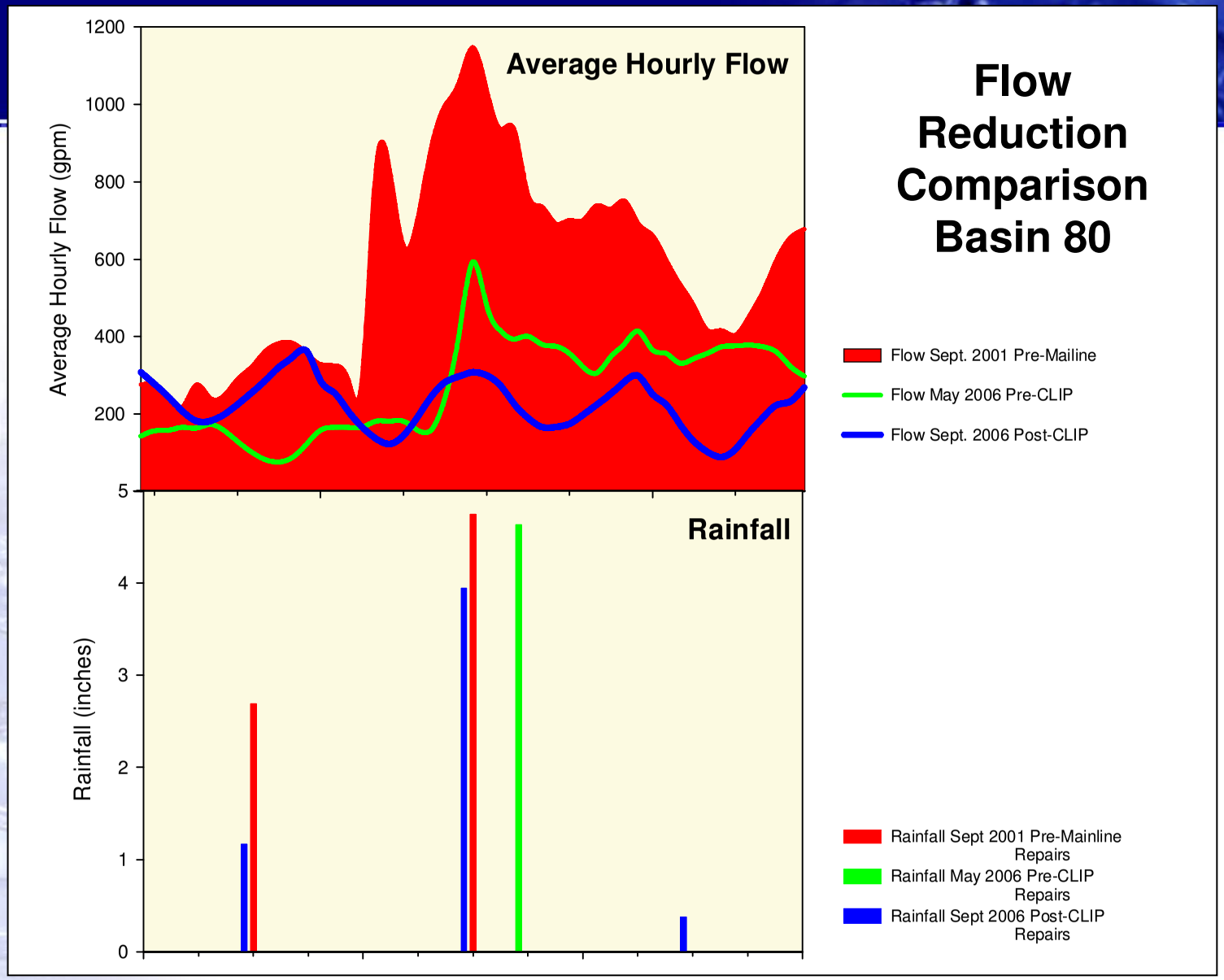
Flow Reduction Comparison Basin 80



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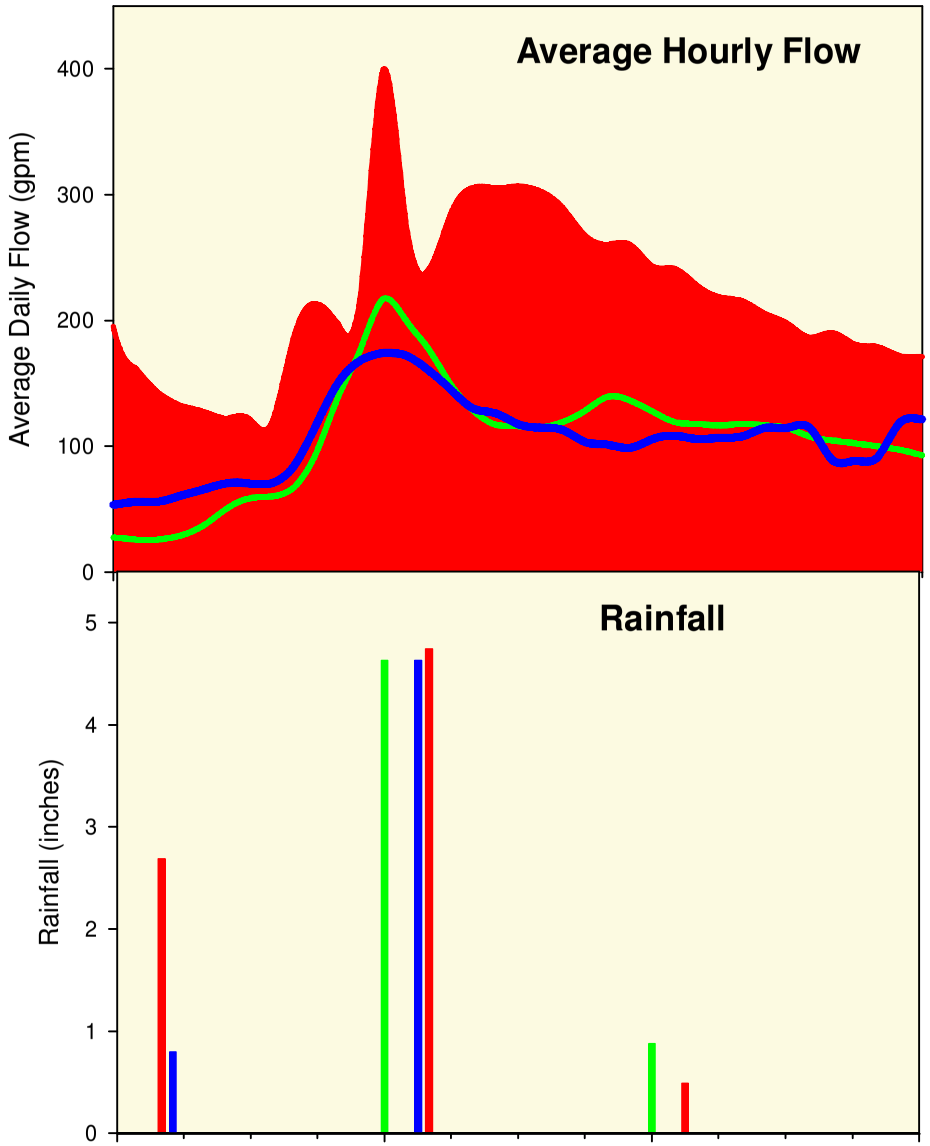
Flow Reduction Comparison Basin 194



Flow Sept. 2001 Pre-Mailine

Flow May 2006 Pre-CLIP

Flow Sept. 2006 Post-CLIP

Rainfall Sept 2001 Pre-Mainline Repairs

Rainfall May 2006 Pre-CLIP Repairs

Rainfall Sept 2006 Post-CLIP Repairs

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CLIP Peak Factor Reduction

				Peak Flow Reduction
Basin 80:				
Initial PF	= 1,147 gpm / 192 gpm	=	5.97	
Final PF	= 308 gpm / 98 gpm	=	2.03	**73%**
Basin 195:				
Initial PF	= 399 gpm / 98 gpm	=	4.07	
Final PF	= 106 gpm / 30 gpm	=	3.53	**73%**

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Lateral Pilot Program Results

Program	$/foot	gpm removed/ foot	$/gpm removed
Mainline Program	$8.68	0.024	$362
Lateral Program	$27.70	0.012	$2,308
Total Program	$36.38	0.036	$1,011
Pump and Treat Alternative			**$8,645**

Program is 1/8th the Cost of Alternative

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Recommendations:

1. Collect data during rain event for remaining basins
2. Identify high RDII basins
3. Complete lateral program for high RDII basins
4. Continue lateral program at a maintenance level at high RDII basins

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