

Medway's Integrated Water Resources Management Plan

Progress Update & Needs Assessment Workshop

IWRMP Task Force, Medway Town Hall, June 28, 2017



Introductions, Objectives



Part 1: 9:30-11:30AM: IWRMP Update

- Present Needs Assessment Method; Findings
- Obtain feedback

Part 2: 1:00-3:30PM: MS4 Notice of Intent Working Session

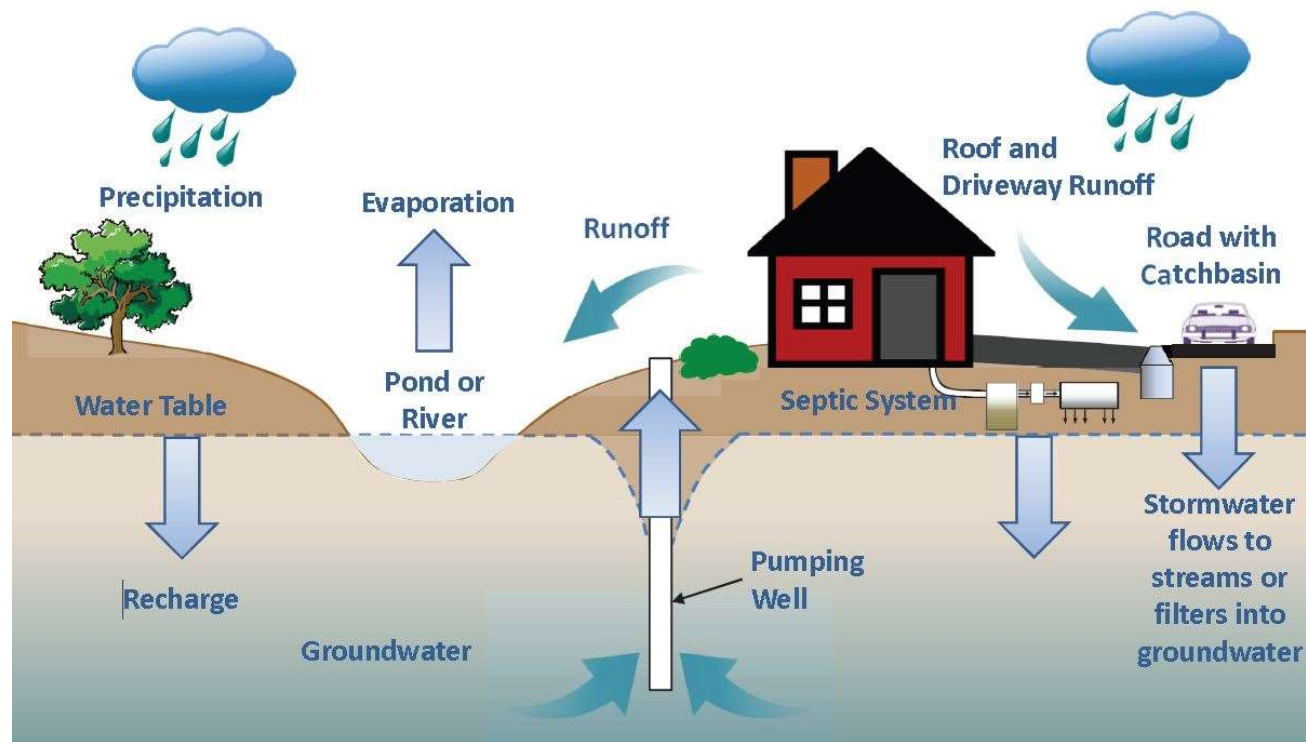
- Provide Update
- MCM 1- Public Education Program Development

IWRMP Update / Needs Assessment Agenda

1. Introductions, Meeting Objectives
2. Integrated Planning Purpose / Benefits
3. Regulatory Context
4. IWRMP Scope and Status
5. Existing Conditions & Needs Analysis:
 - i. Drinking Water
 - ii. Wastewater
 - iii. Stormwater
6. Next Steps



Why Integrated Water Resources Planning?



Water resources and infrastructure are all interconnected !

Medway's Water Resources Challenges

Water bans in effect as drought continues

[Medway: State executive OKs Exelon expansion](#) Milford Daily News

With **Medway** unable to provide the average of 95,000 gallons of **water** the plant will need per day, Exelon has been in talks with neighboring Millis to ...

Storm water permit, and huge expense, may be incoming

**WATER SUPPLY & DEMAND ASSESSMENT
IN RELATION TO
EXELON POWER 'WEST MEDWAY II' PROJECT**

Water: a costly commodity in MetroWest

Like Bellingham, Medway's water is pumped out of the ground, which brings naturally occurring high levels of iron and manganese.

Medway crews repond to three water main breaks

Medway losing 100,000 gallons of water a day

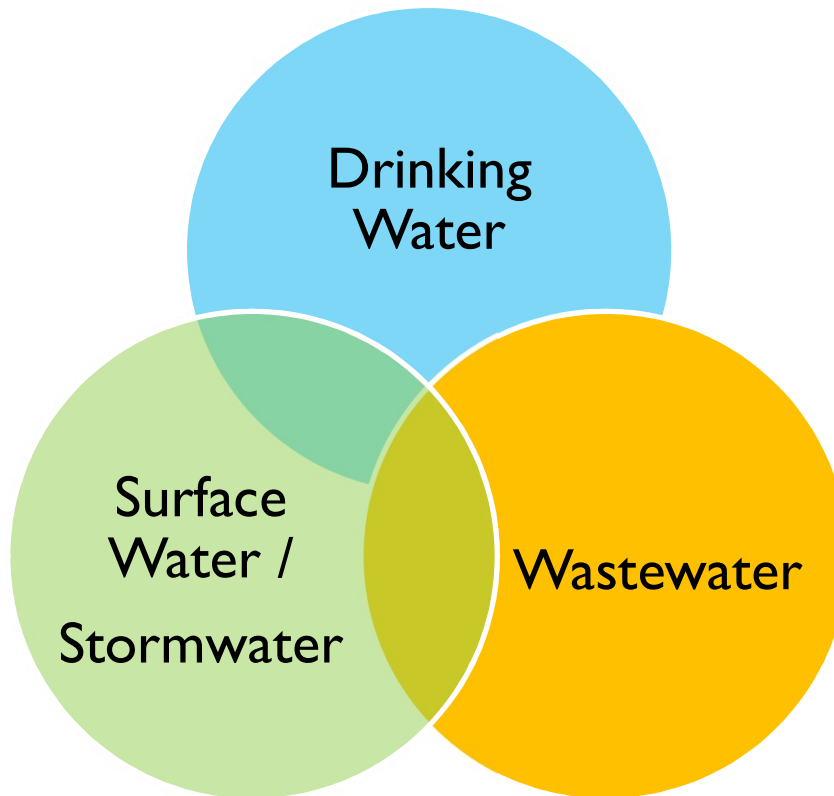
By Zachary Comeau, Daily News Staff

Why Integrated Water Resources Planning?

- *Pressure on aging infrastructure*
- *Pressure on available land*
- *Competition for limited resources*



What is Integrated Water Resources Planning?

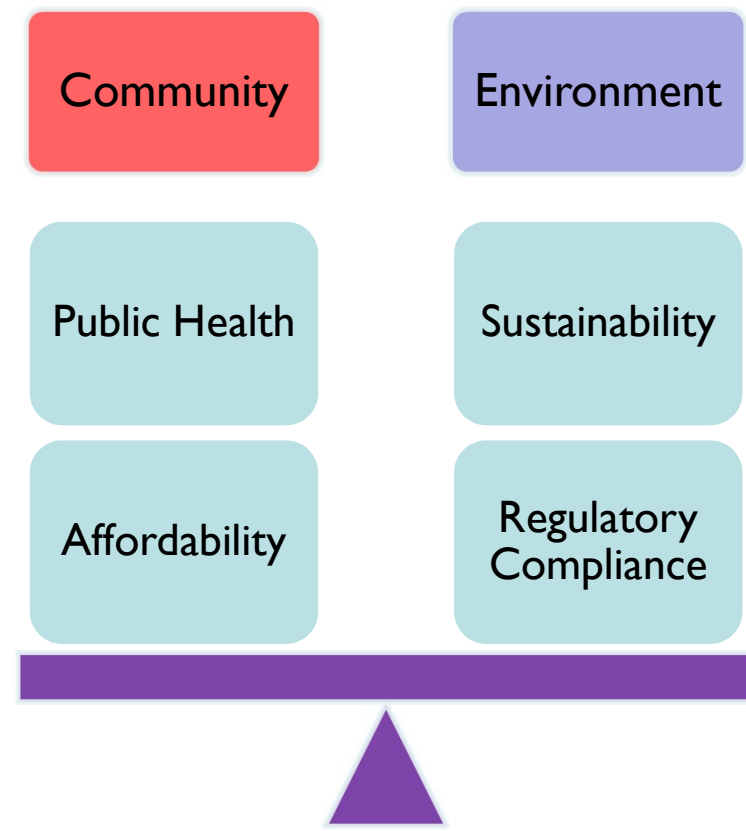


- What Resources exist?
- What condition are they in?
- What requirements must be met?
- What are the needs & priorities of the community?
- How can they be balanced and sequenced?
- What is our short & long term plan?

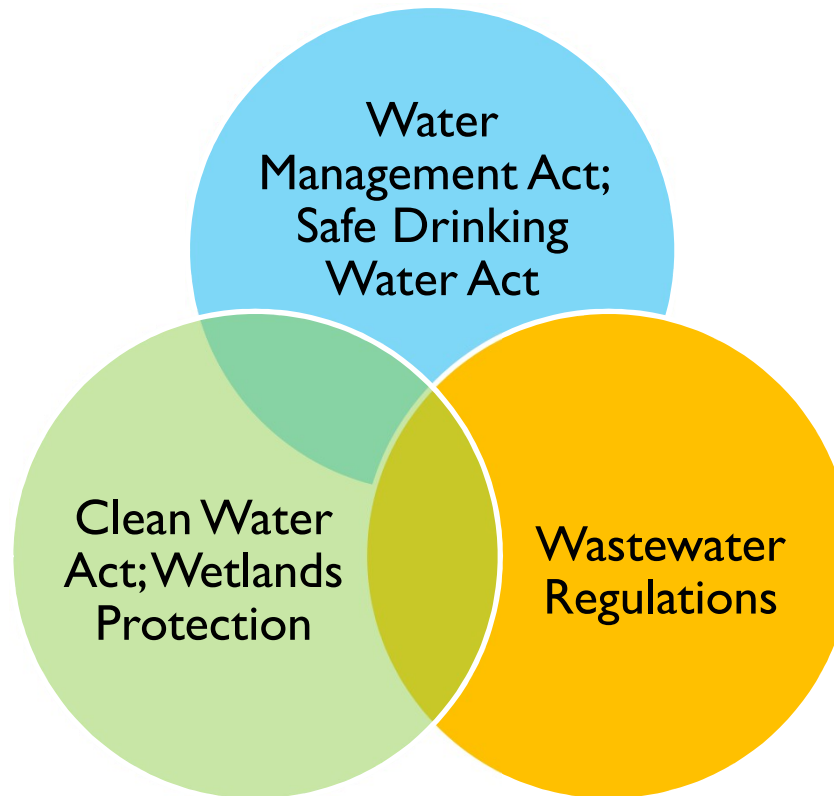
What is Integrated Water Resources Planning?

“evaluates alternative means for addressing current and future wastewater, drinking water, and stormwater needs and identifies the most economical and environmentally appropriate means of meeting those needs”

- MassDEP



Regulatory Context & Integrated Water Resources Planning



Water resources and infrastructure regulations overlap !

Benefits of Integrated Water Resources Planning

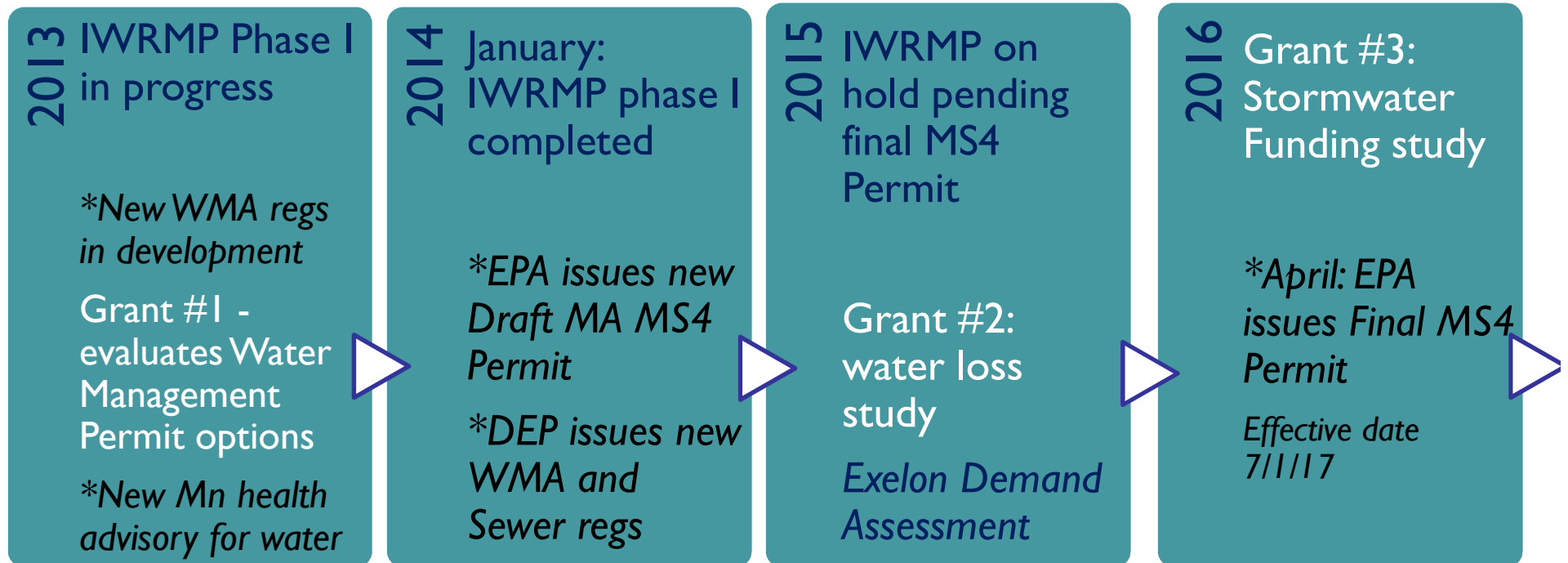
- Needs identified
- Solutions prioritized



- Proactive vs reactive
- Proceeding holistically provides efficiency
- Increase access to funding; regulatory leverage
- *Medway well-positioned to balance growth with environmental / fiscal sustainability while maintaining regulatory compliance*

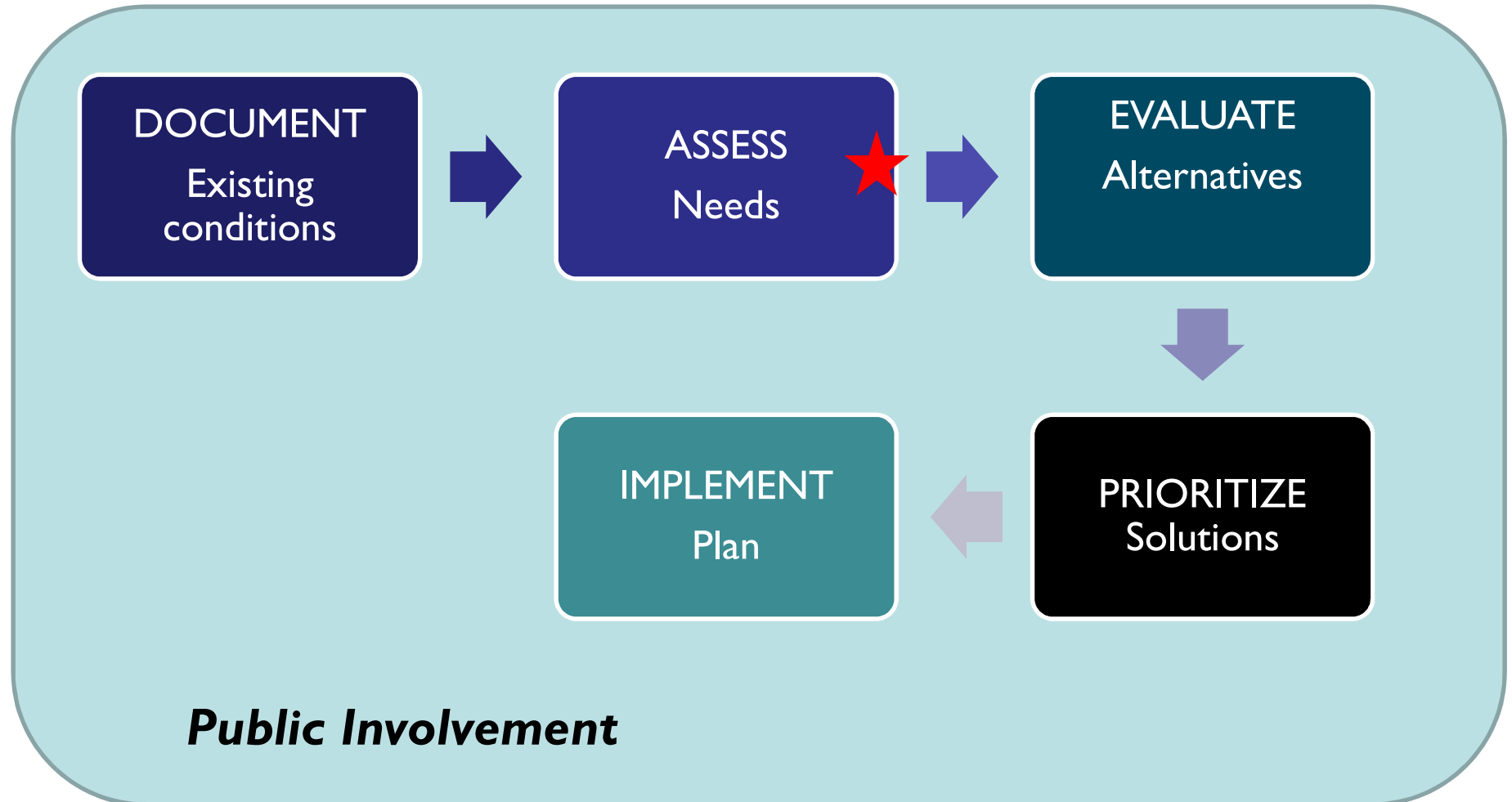


Medway IWRMP History & *Regulatory Changes**



December 2016 – Medway authorizes Kleinfelder to proceed with the remainder of IWRMP process

Integrated Water Resources Planning Process



IWRMP Phase I / Phase II



Phase I:

Focus on MS4 Compliance Tasks

Begin Documenting Stormwater Existing Conditions

- ☑ Advisory Task Force convened (that's you!)
- ☑ Stormwater Educational Outreach Materials
- ☑ GIS Outfall Compilation & Stormwater Map
- ☑ Priority Outfall Inspection & GPS Location
- ☑ Illicit Discharge Detection & Elimination Plan
- ☑ Municipal Good Housekeeping Manual

IWRMP Phase II Tasks; Scope, Schedule

		6/27/2017		FY17	FY18	FY18	FY18	FY18
IWRMP TASKS		% Complete	TASK	Q4	Q1	Q2	Q3	Q4
		38%		A M J	J A S	O N D	J F M	A M J
Task Force (*); Public Meetings (X)	DW / WW / STORM	50%	1		*	X*	*	X*
Existing / Future Conditions	DRINKING WATER	95%	2					
	WASTEWATER	75%						
	STORMWATER	75%						
Needs Assessment	DW / WW / STORM	75%						
Evaluate Alternatives	DW / WW / STORM	0%	3					
ID Technologies / Sites	WW/ SW		3					
Screening & Recommendation	WW		4					
Evaluate Options; Conceptual Design & Cost	DW / WW / STORM		5					
Plan Development	DW / WW / STORM	25%	6					

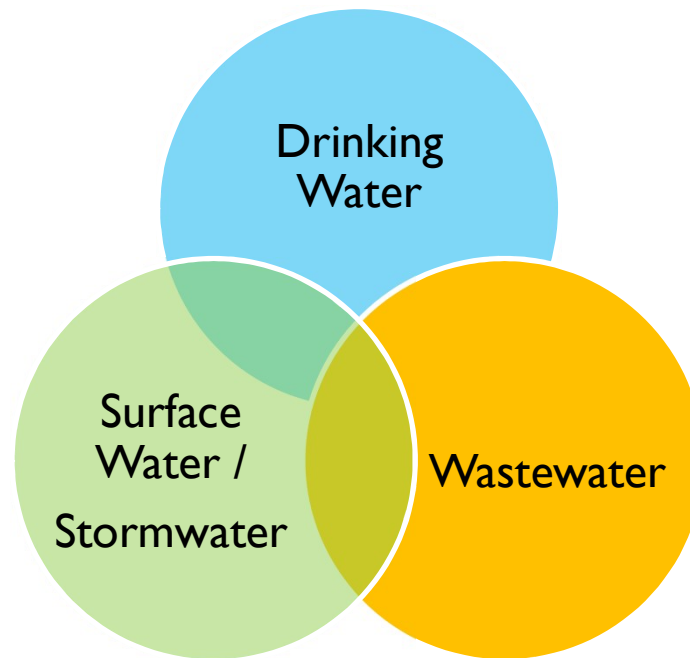


Drinking Water

IWRMP Needs Assessment



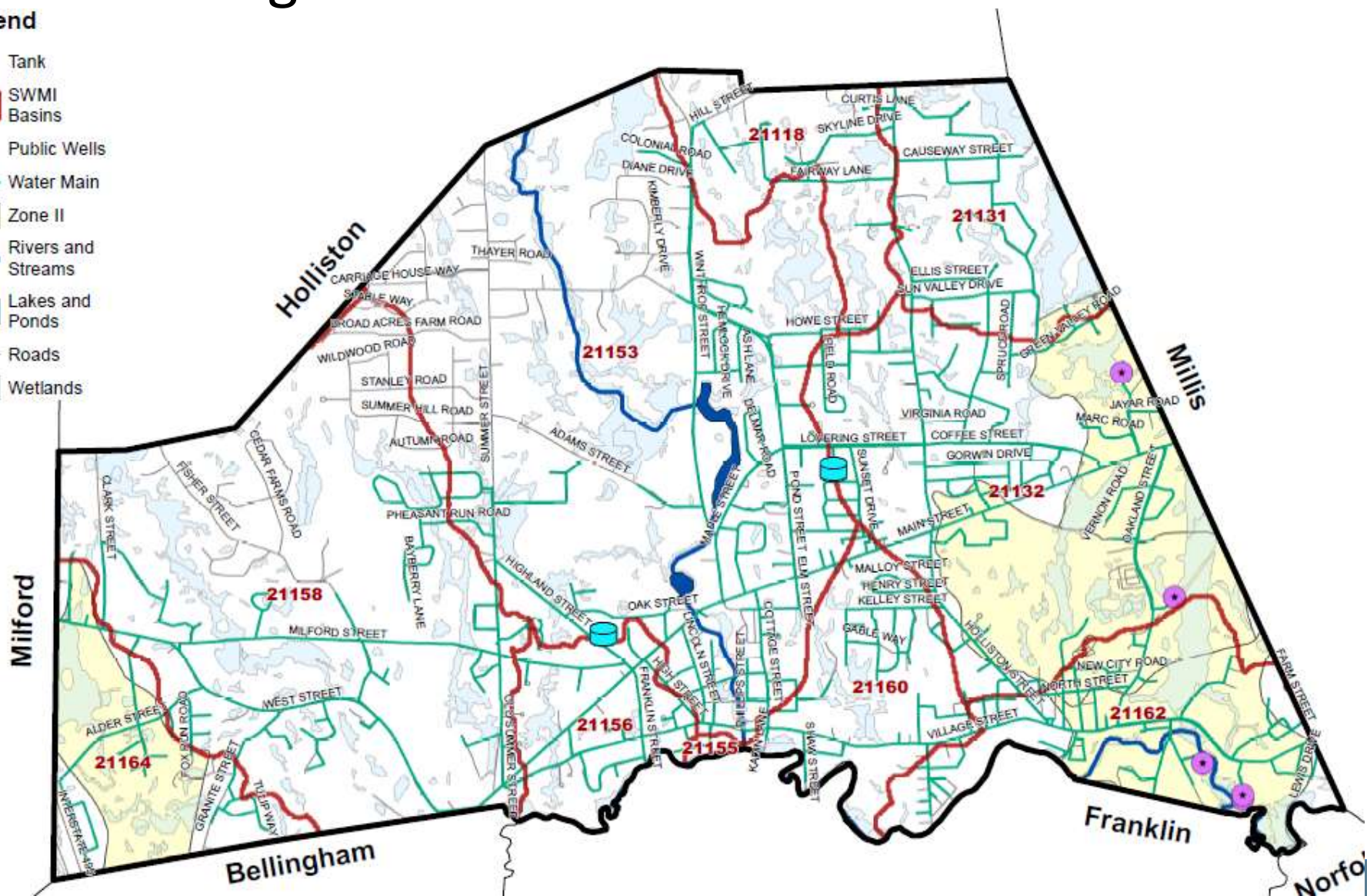
Integrated Planning: Drinking Water



Drinking Water Resources

Legend

-  Tank
-  SWMI Basins
-  Public Wells
-  Water Main
-  Zone II
-  Rivers and Streams
-  Lakes and Ponds
-  Roads
-  Wetlands



Needs Assessment: Drinking Water

Information Sources

- DPS Records & Staff knowledge
- 2010 Water Master Plan (W&S)
- Groundwater exploration summary (H&W)
- 2013 Water Management Study (KLF)
- 2014 Water Loss evaluation (KLF)
- 2015 Exelon Demand Study (KLF)

Needs Assessment: Drinking Water

- Lack of well supply capacity
- Lack of well redundancy
- Demands increasing
- Un-accounted for water (~15%)
 - Aging water mains; leaks
 - Unmetered connections?
- Iron & manganese levels requiring treatment



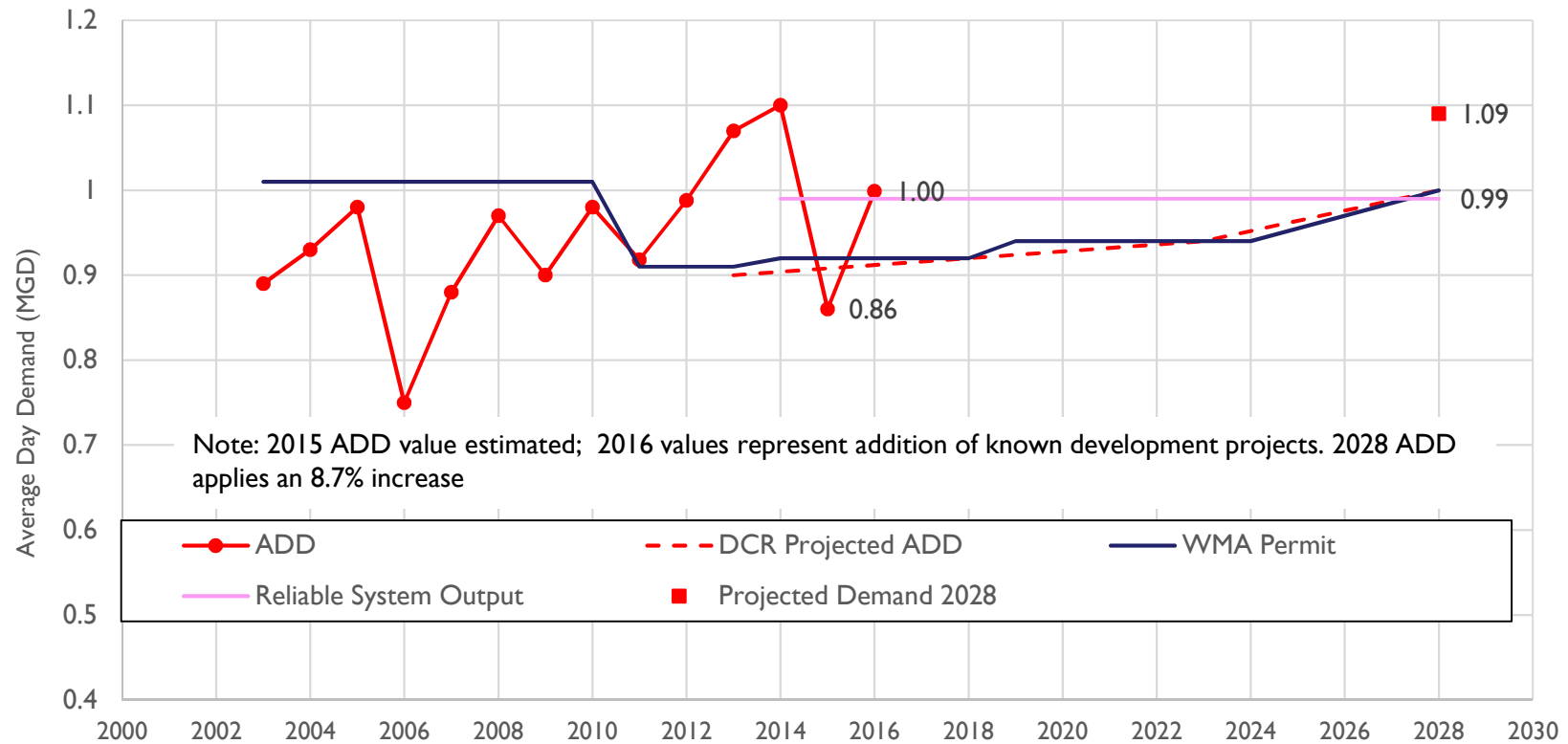
Source: Exelon Water Supply Study, 2015, KLF

Needs Assessment: Drinking Water

- Unable to meet max daily demand with largest source offline
- Barely able to meet current average day demand
- Significant future supply deficit projected
- New regulatory constraints (WMA)
- Offsets required for higher withdrawal authorization

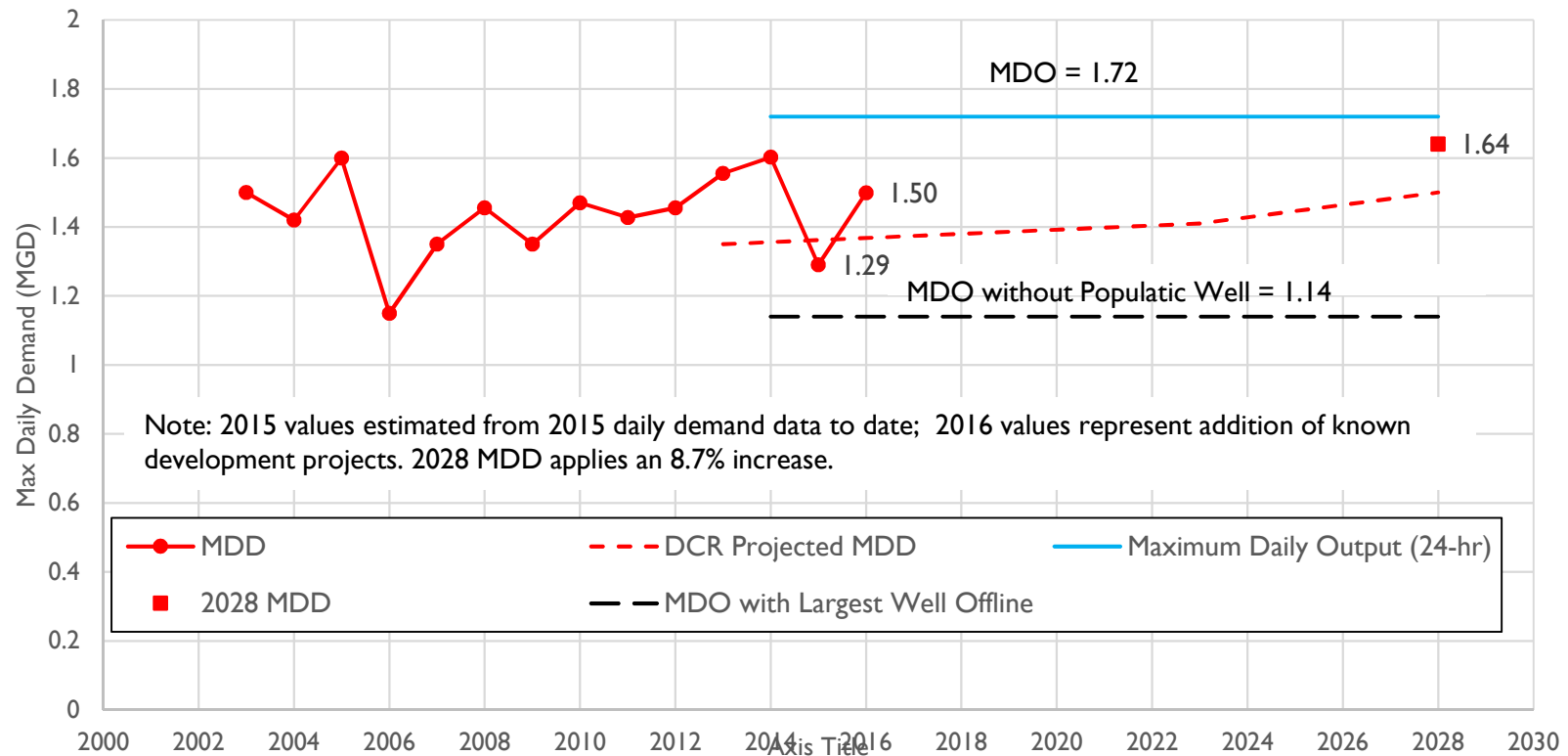
Source: Exelon Water Supply Study, 2015, KLF

Needs Assessment: Drinking Water - ADD



Source: Exelon Water Supply Study, 2015, KLF

Needs Assessment: Drinking Water - MDD



Source: Exelon Water Supply Study, 2015, KLF

Recommendations : Drinking Water

Continue / Ongoing

- Continue / enhance demand mgmt.; water loss reduction programs
 - UAW (Water loss) Compliance Plan:
 - meter testing / replacement program
 - Annual Leak detection
 - Conservation education/outreach
 - Fixture retrofits
 - Rebates
 - Water ban

Source: Exelon Water Supply Study, 2015, KLF

Recommendations : Drinking Water

Near Term

- Implement annual well rehabilitation program to restore lost capacity; increase resiliency (1/yr)
- Consult with DEP on new WMA Permit application; identify credits
- Satellite well exploratory study
- Evaluate water purchase from Millis
- Water treatment facility alternatives study

Source: Exelon Water Supply Study, 2015, KLF

Recommendations : Drinking Water

Mid – Longer Term:

- Construct satellite well at Populatic
- Construct treatment facility to provide approx. 1.8 MGD total of treated supply
- Emergency purchase agreement with Millis
- Water main replacement as recommended in 2010 Master Plan

Source: Exelon Water Supply Study, 2015, KLF



Drinking Water

Discussion on Priorities / Next Steps



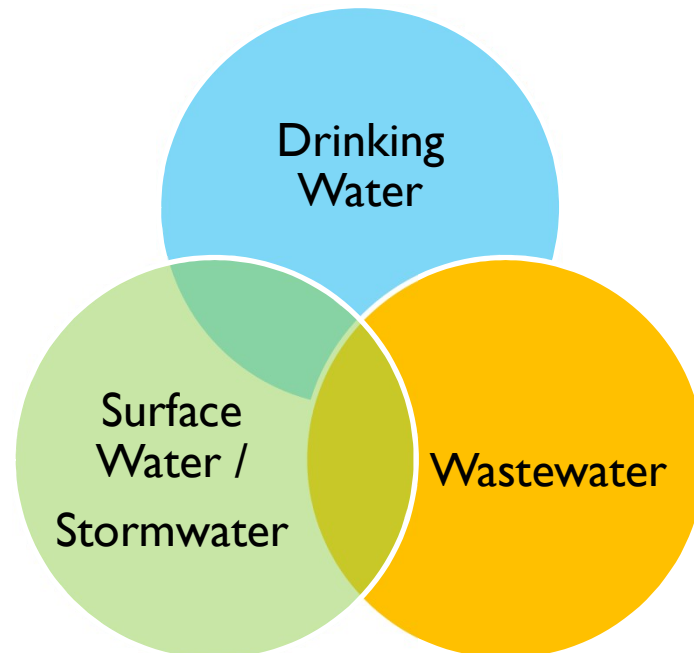
Wastewater

IWRMP Needs Assessment



Integrated Planning: Wastewater

- Sanitary Sewer Overflows (SSOs)
- Illicit Connections
- Septic Discharge
- Water Resource Protection:
 - Recreational Waters
 - Zone II Protection Areas



Wastewater System Challenges

- Wastewater regulations
- CRPCD disposal costs
- CRPCD discharge limits
- Sewer moratorium
- Increasing development pressure on permit limits & land
- Septic systems failing in unsewered areas
- Physical limitations- High groundwater, extensive wetlands; poorly drained soils.



Wastewater Needs Assessment – Data Sources

- Past I/I study reports
- CRPCD flow estimates
- DPS interviews
- GIS layers
- Board of Health records
- Interviews with Planning; Economic Development

Identification of Needs: Sewered Areas

Legend

Town Boundary



Rivers and Streams



Lakes and Ponds



Sewer Main



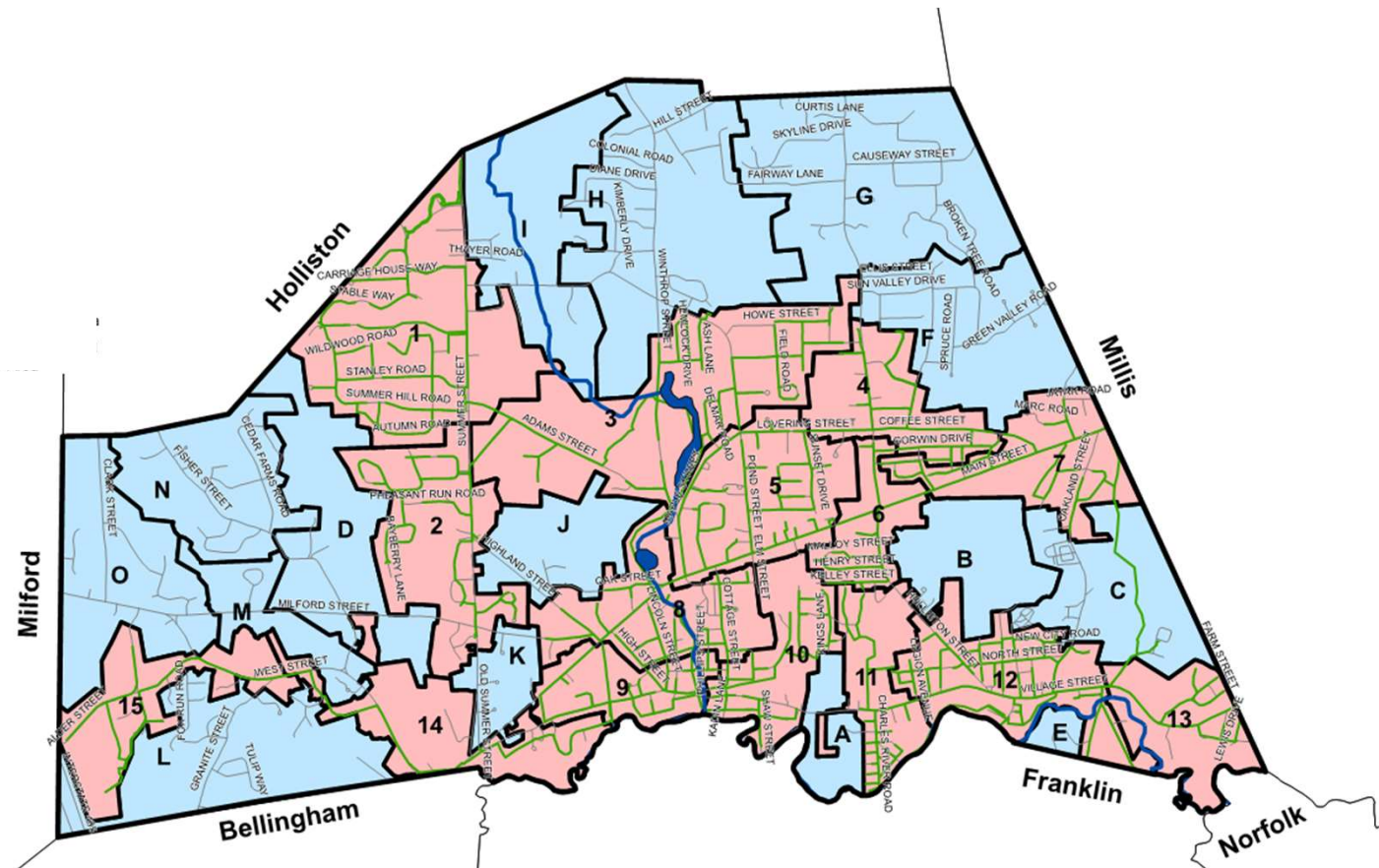
Roads



Sewered Area

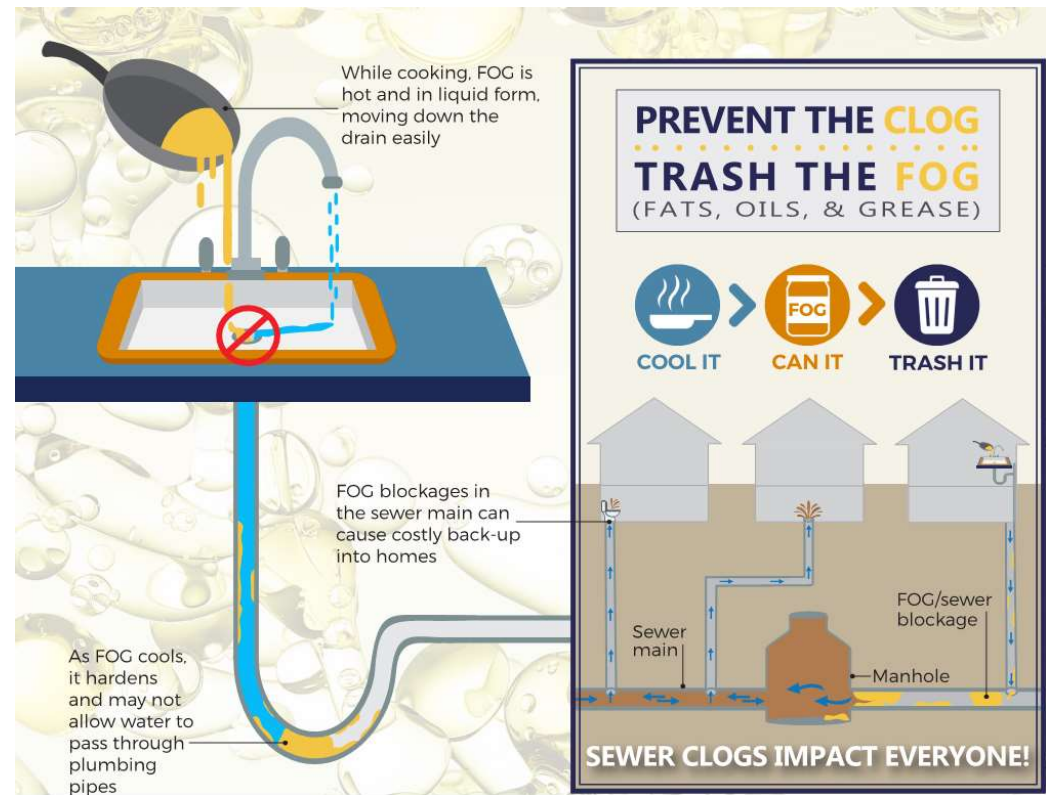


Non-Sewered Area



Sewered Area Needs

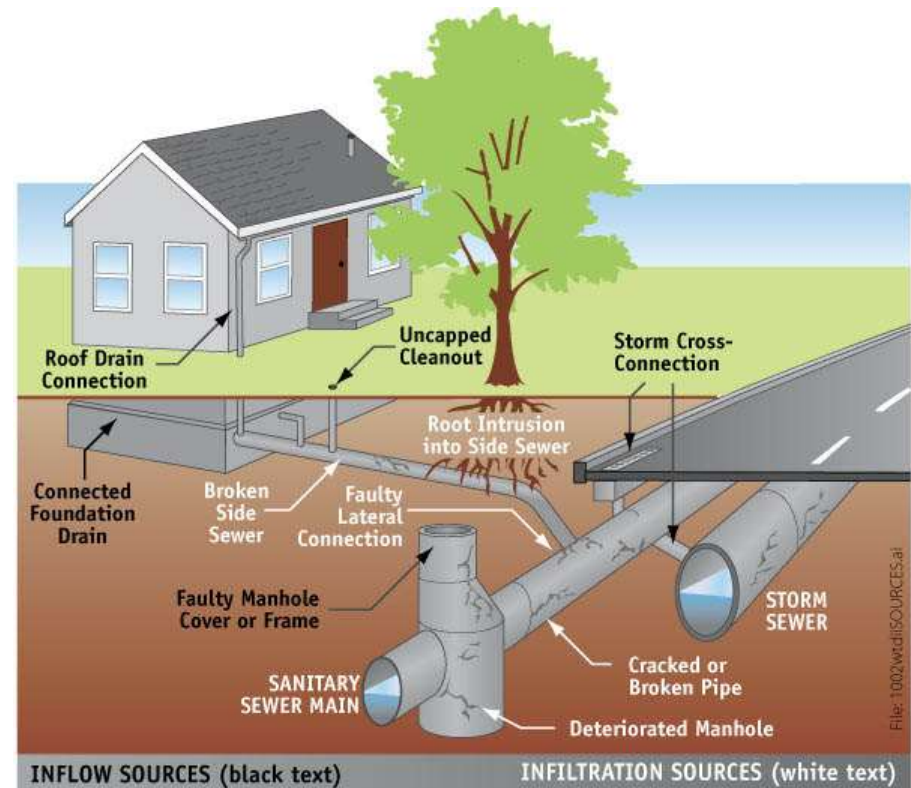
- Maintenance Needs:
 - Fats, Oils, Grease (FOG)
 - Root Removal
 - Pump Station Operation
- Buildout Needs
 - Subdivision
 - Unclaimed Capacity (Betterments)



Source: City of Cambridge

Sewered Area Needs

- Infiltration/Inflow (I/I) Removal
 - Ongoing Investigation Program
 - Metering
 - CCTV Inspection
 - Manhole Sealing
 - Cured in Place Pipelining (CIPP)



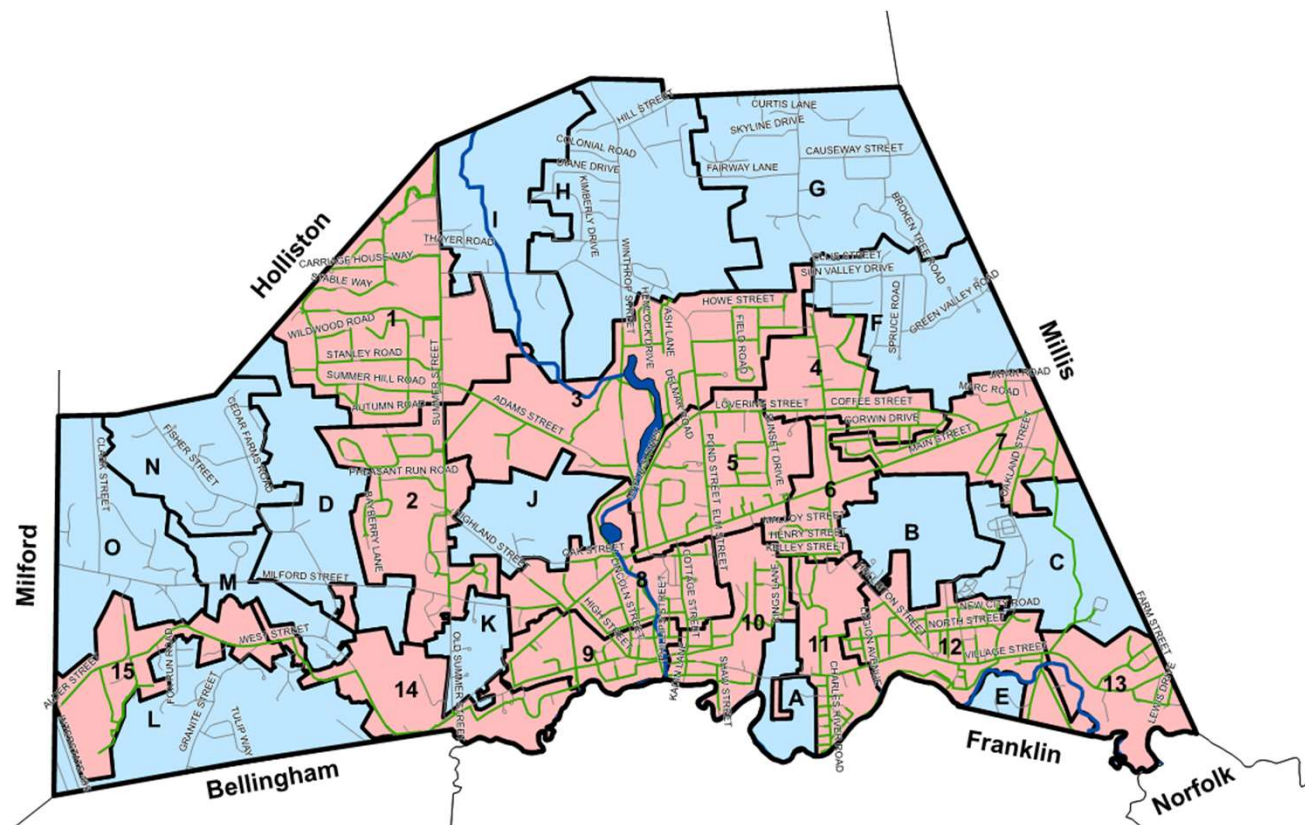
Sewered Area: Data Gaps

- Town-wide metering
 - Partial Metering at CRPCD
 - Temporary meters to identify I/I
 - Permanent meter to confirm flow to CRPCD
- System Condition Assessment
 - CCTV Inspection of full system
 - Partial inspection completed as part of I/I

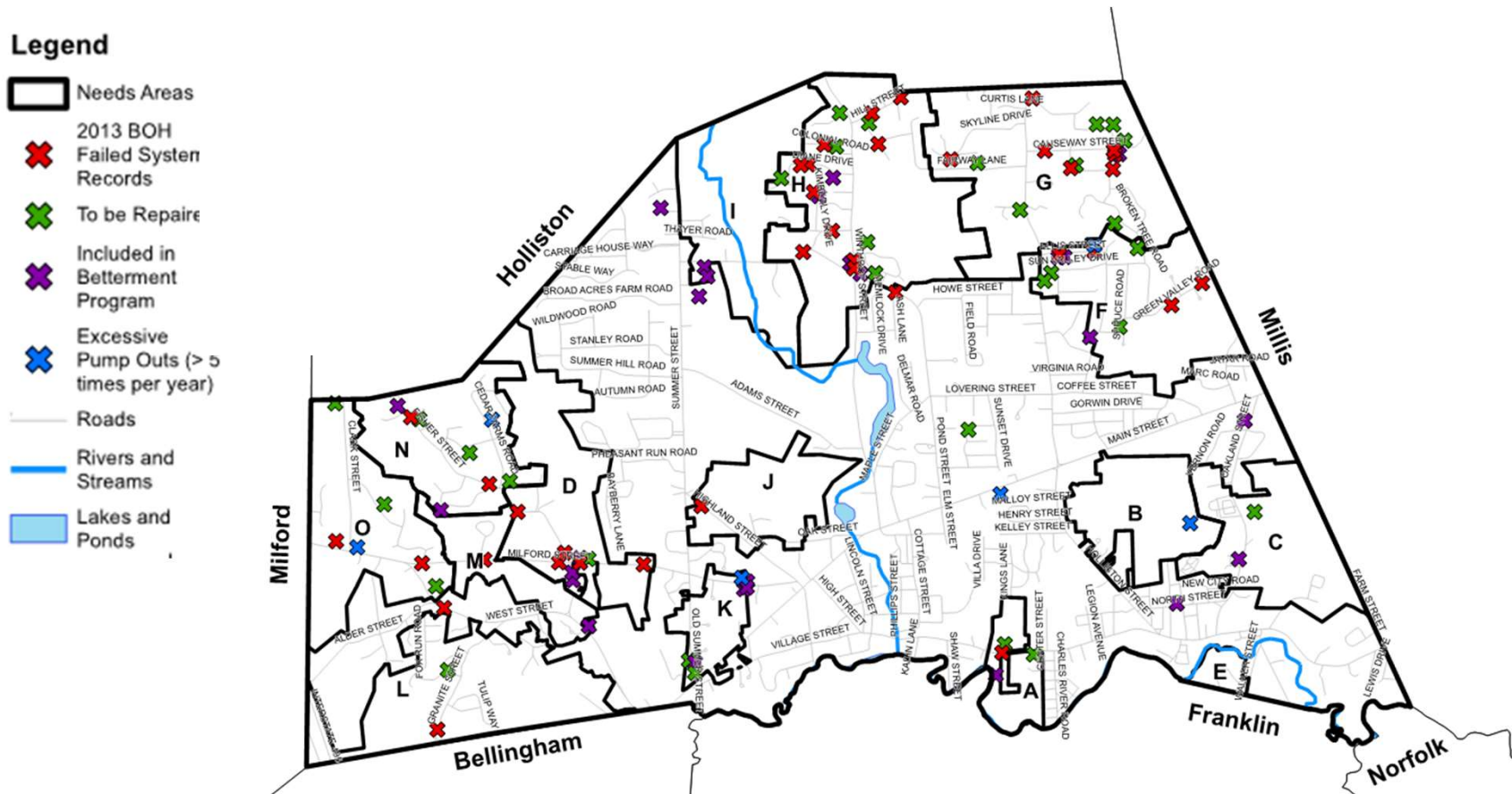
Sewered Area Alternative Evaluation (Next Steps)

- Public Education
 - FOG
 - Illicit Connections
 - Private Inflow Sources
- Continue I/I Investigations and Rehabilitation
 - Town-wide metering program
- Condition Assessment

Identification of Needs: Unsewered Areas



Septic System Failures





Depth to Groundwater

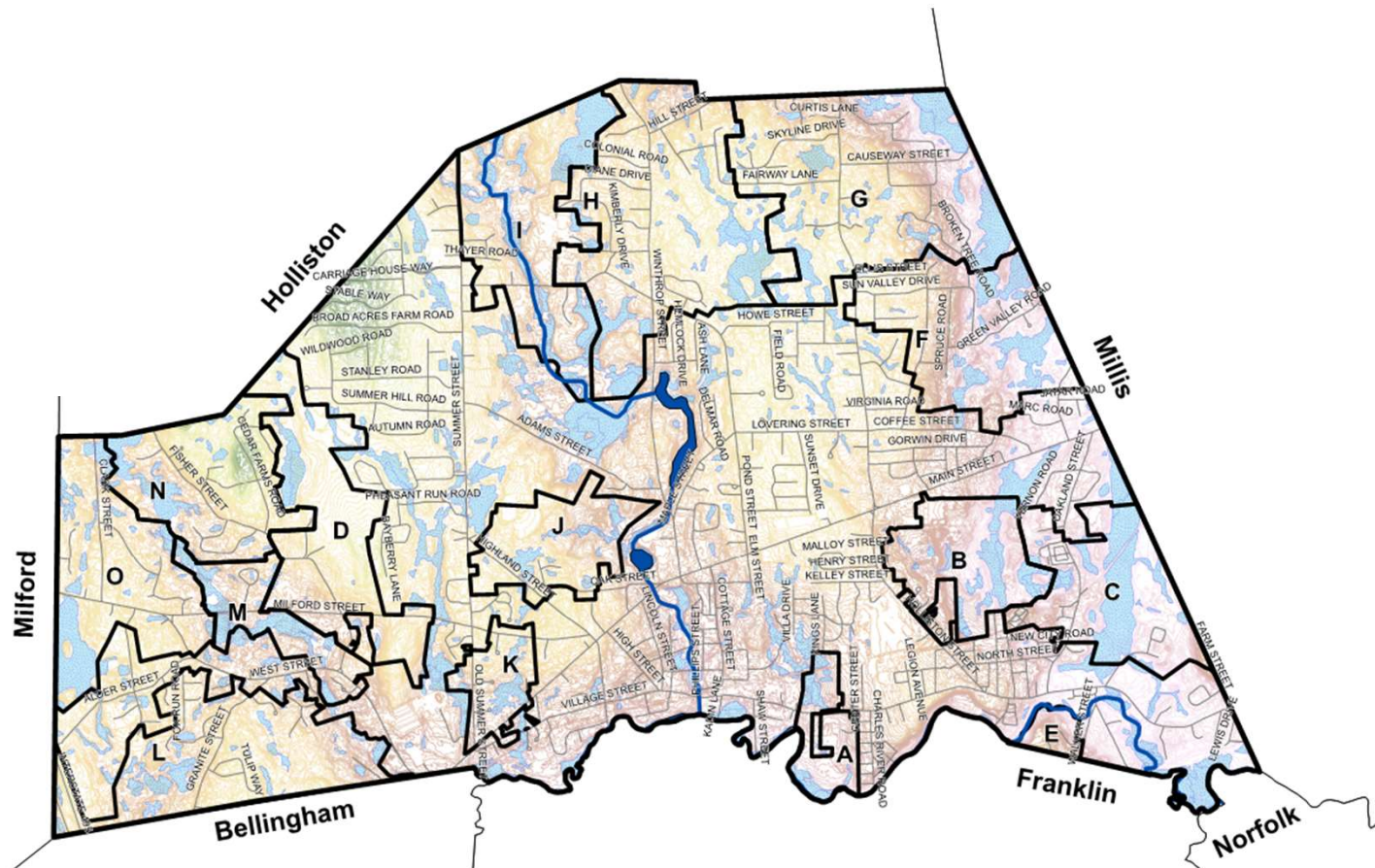
Legend

-  Needs Areas
-  Rivers and Streams
-  Lakes and Ponds
-  Wetlands
-  Roads

Elevation (ft)

Elevation

-  126 - 141
-  142 - 156
-  158 - 172
-  174 - 187
-  188 - 202
-  204 - 218
-  220 - 233
-  234 - 248
-  250 - 264
-  266 - 279
-  280 - 294
-  296 - 310
-  312 - 325
-  328 - 340
-  346 - 368



Protected Waters

Legend

Needs Areas

Rivers and Streams

Lakes and Ponds

Roads

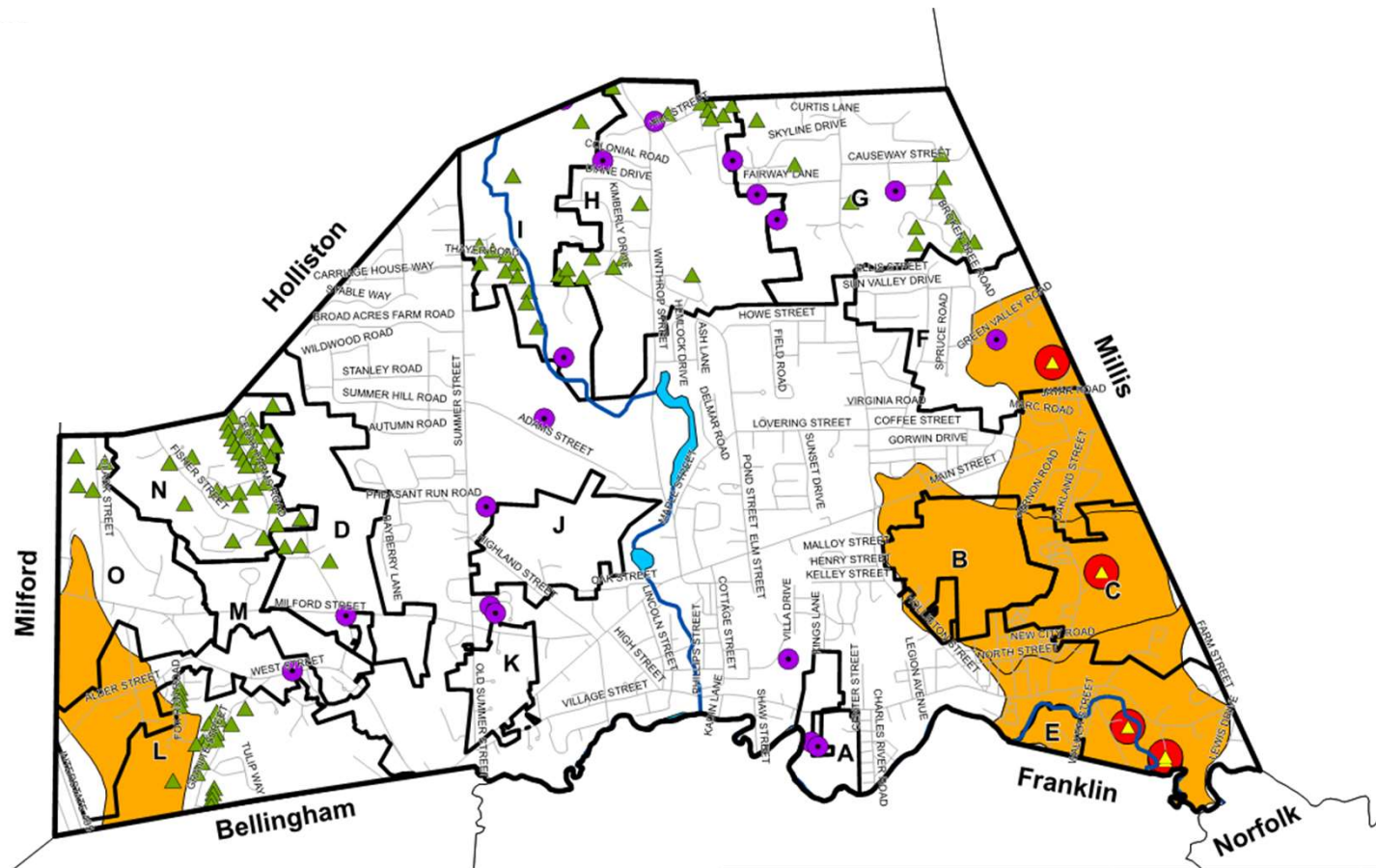
Public Well

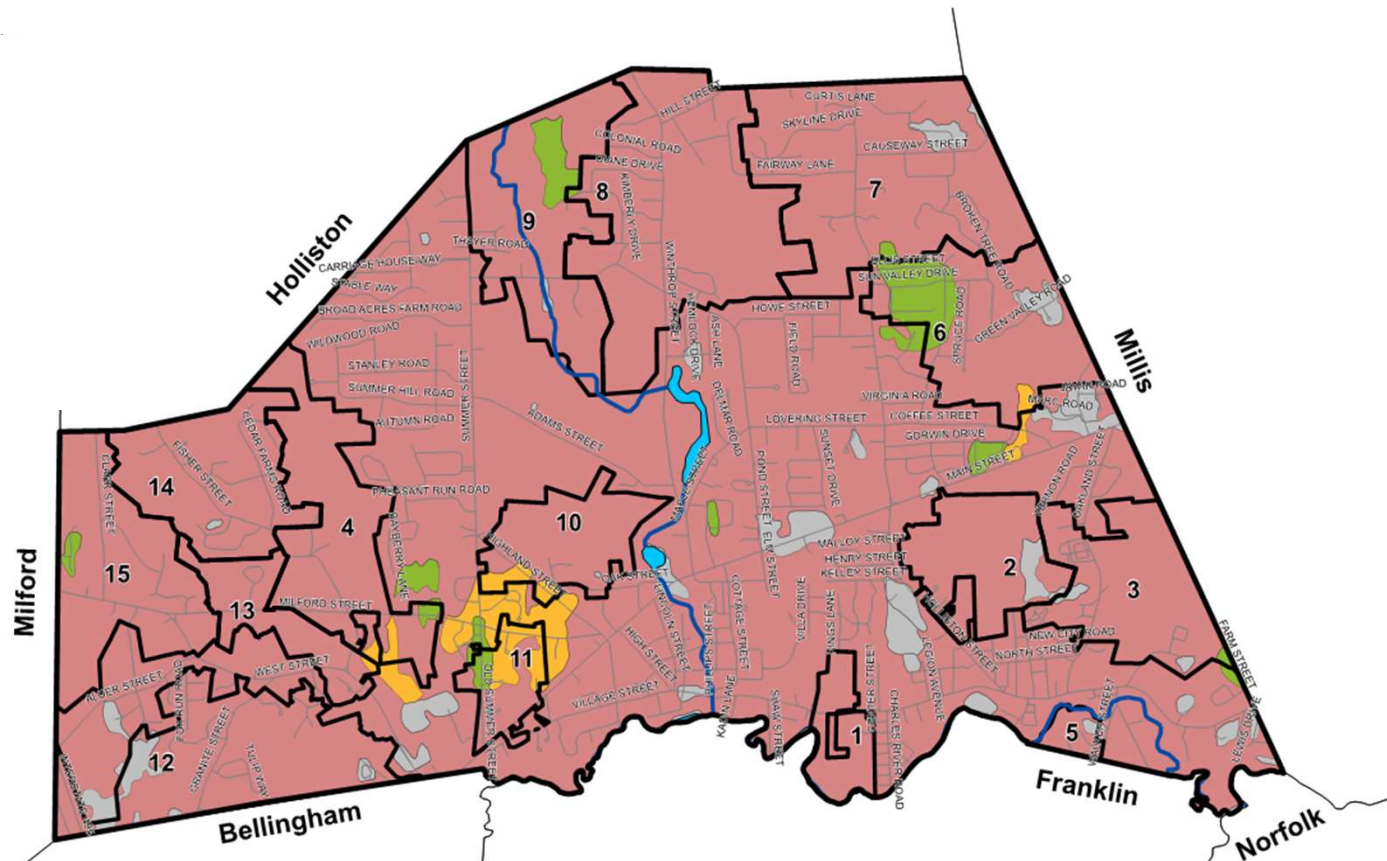
Private Well

Vernal Pool

Wellhead Protection Area (Zone I)

Wellhead Protection Area (Zone II)
















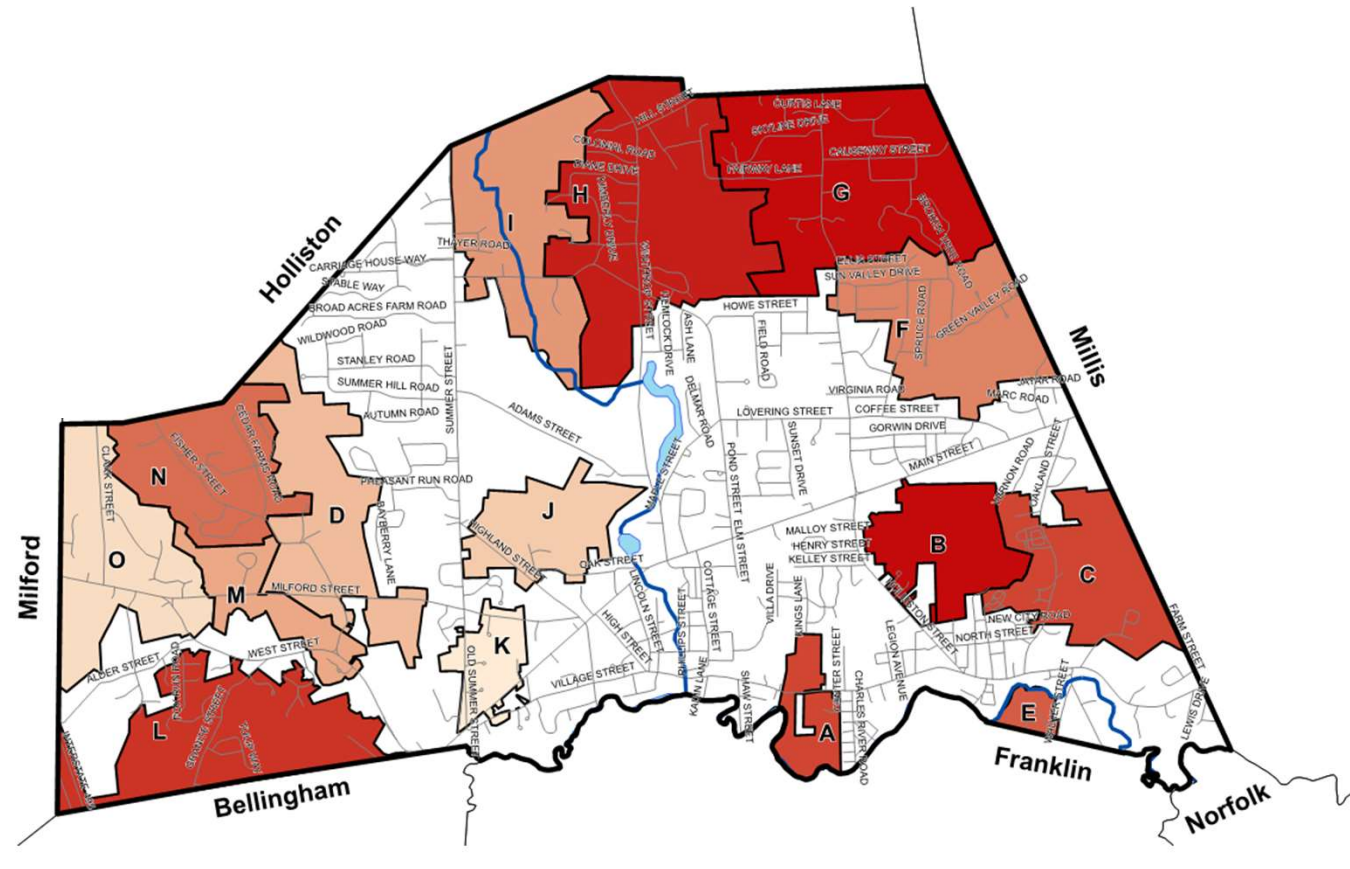
Unsewered Area Needs Ranking

Legend

-  Rivers and Streams
-  Lakes and Ponds
-  Roads

Needs Areas Ranking

-  B, G
-  H
-  L
-  A, C
-  E
-  N
-  F
-  I
-  M
-  D
-  J
-  O
-  K



Summary of Unsewered Area Needs Analysis

Needs Area	Failures and Pump-Outs	Soil Suitability for Septic	Depth to Groundwater	Private Wells	Wetlands	Vernal Pools	Zone IIs	<i>Total</i>	Ranking
A	2	10	8	0	6	6	0	32	6
B	0	10	8	0	9	0	10	37	2
C	1	10	10	0	1	0	10	32	6
D	4	9	0	2	0	2	0	17	12
E	0	10	7	0	4	0	10	31	7
F	5	3	8	0	5	2	4	27	9
G	7	10	4	2	4	10	0	37	2
H	10	10	1	3	8	4	0	36	3
I	1	7	3	9	2	4	0	26	10
J	0	8	2	0	4	2	0	16	13
K	2	0	3	0	2	2	0	9	15
L	1	10	2	6	10	2	2	33	4
M	1	10	4	0	3	0	0	18	11
N	4	10	0	10	6	0	0	30	8
O	3	9	1	0	0	0	2	15	14

Upcoming Development Projects

Legend

Town Boundary



— Sewer Main

— Rivers and Streams

— Lakes and Ponds

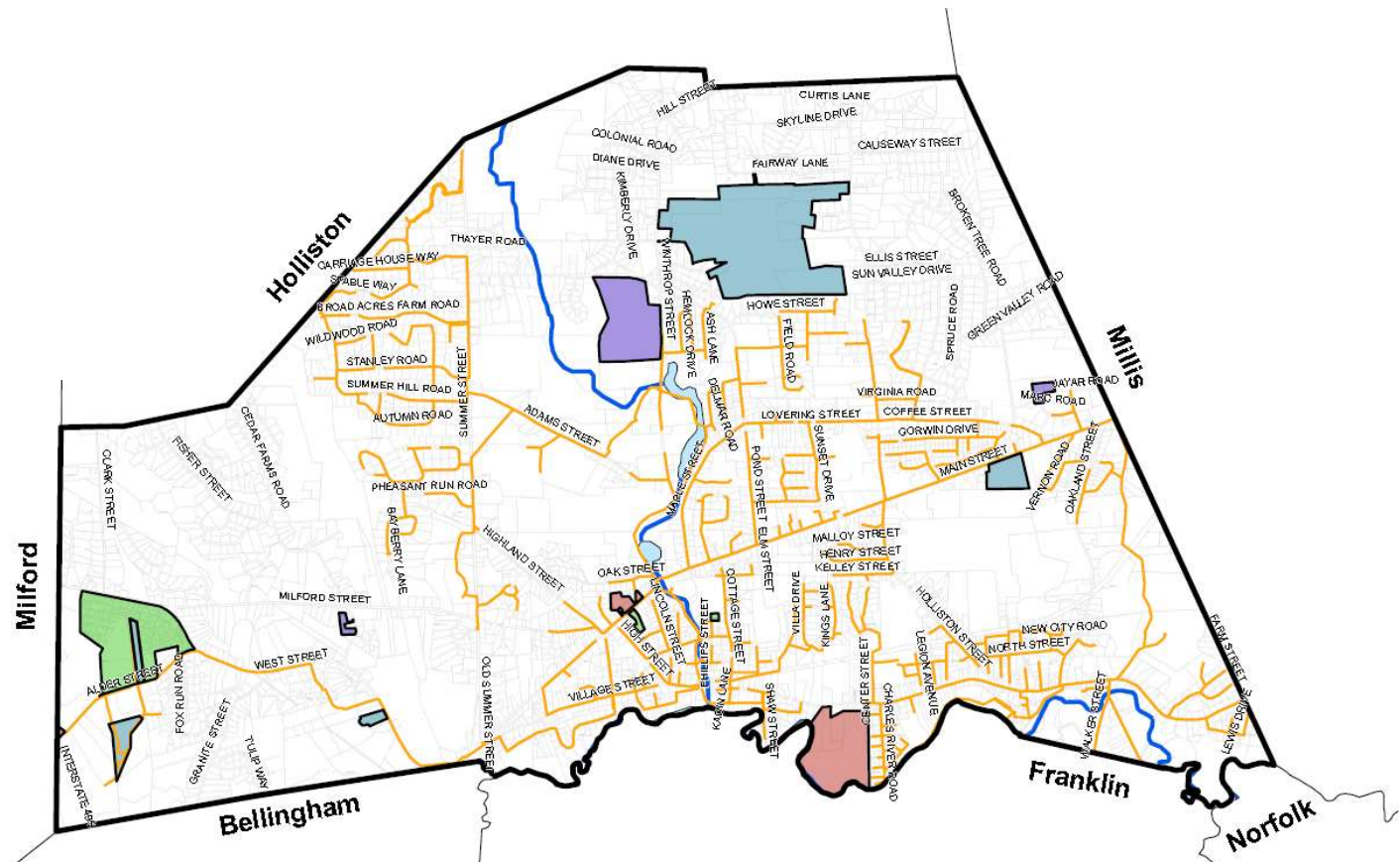
Project Status

— In Permitting Process

— Permitted

— Planned/Conceptual

— Under Construction



Unsewered Area Needs

- Decentralized Treatment System
 - Improve Water Quality
 - Promote Groundwater Recharge
- Septic Needs Support Funds
- Sewer Extensions
 - Protect Water Supply Sources



Source: EPA

Unsewered Area Alternative Evaluation (Next Steps)

- Decentralized Treatment Evaluation
 - High Needs Areas
 - Town-Owned Property
 - Suitable Soils
- Evaluate Sewer Extension Options
 - Create Capacity
 - Prioritize Drinking Water Protection



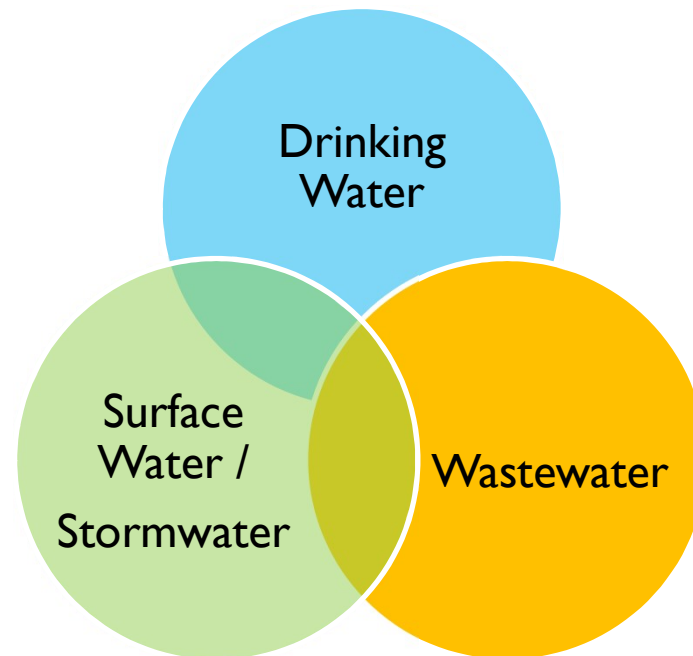
Stormwater

IWRMP Needs Assessment



Integrated Planning: Stormwater

- Illicit Connections
- Inflow Sources (Flooding)
- Infiltration of Contaminated Water
- Drought Impacts
- Water Resource Protection:
 - Recreational Waters
 - Zone II Protection Areas



Stormwater Needs Assessment – Data Sources

- Phase I Task results
- Stormwater Funding Grant Workshops
- DPS interviews
- Results of outfall inspections
- GIS layers
- Drainage hand sketches; record drawings

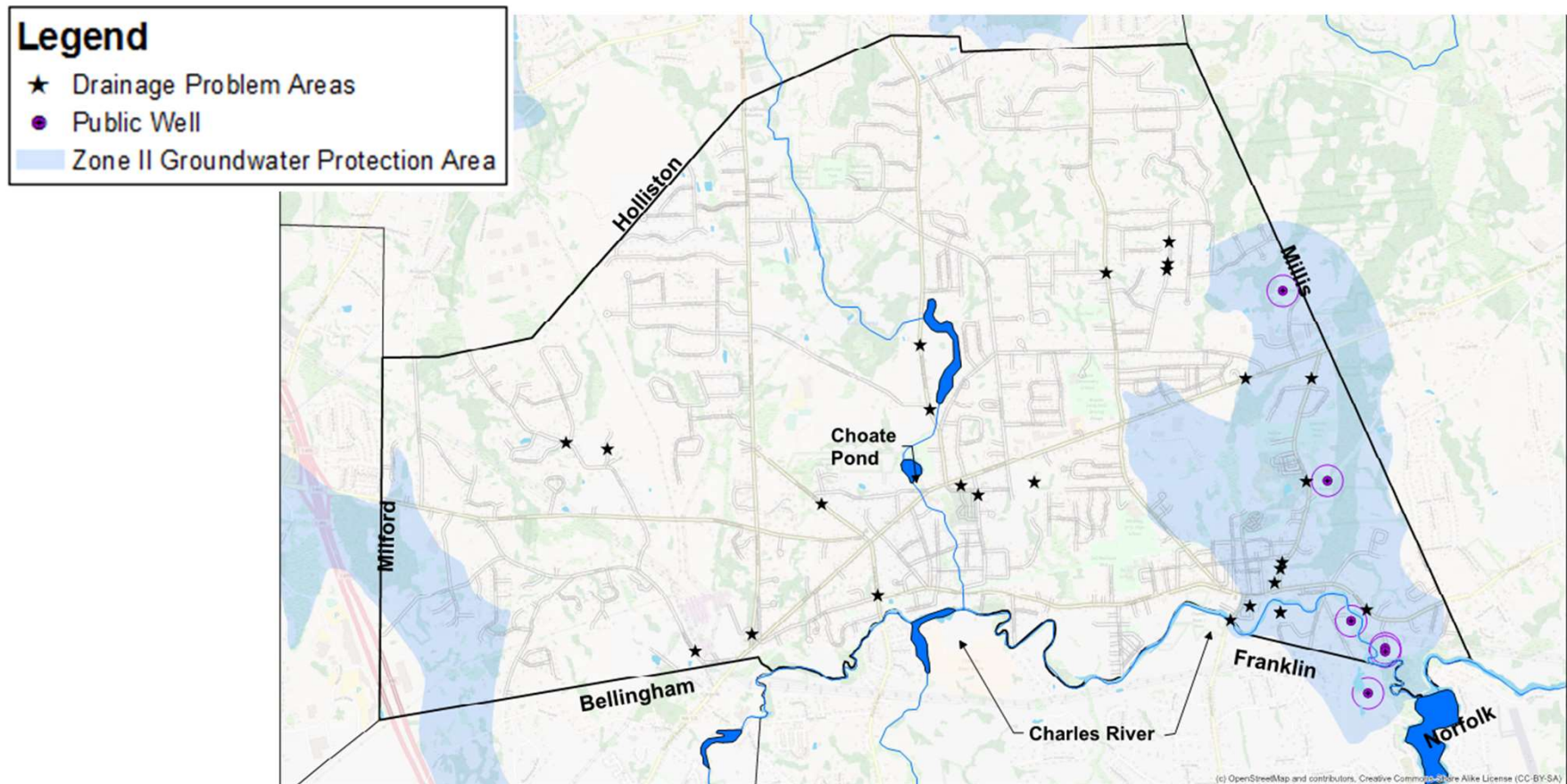


Stormwater System: Maintenance (Hydraulic) Needs

- Localized Flooding
 - Low Topography
 - Sedimentation
 - Blocked Catch Basins
 - Beaver Activity
- Mapping of System
 - Delineate Catchments

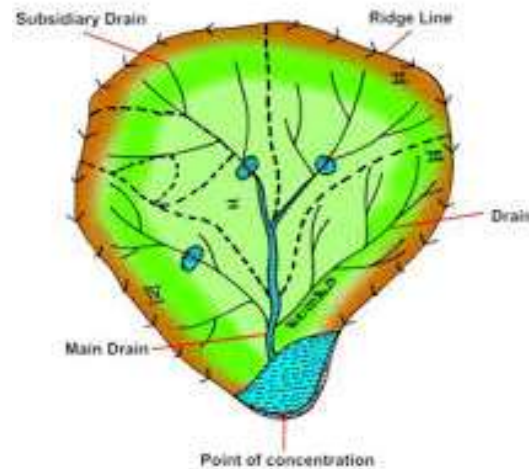
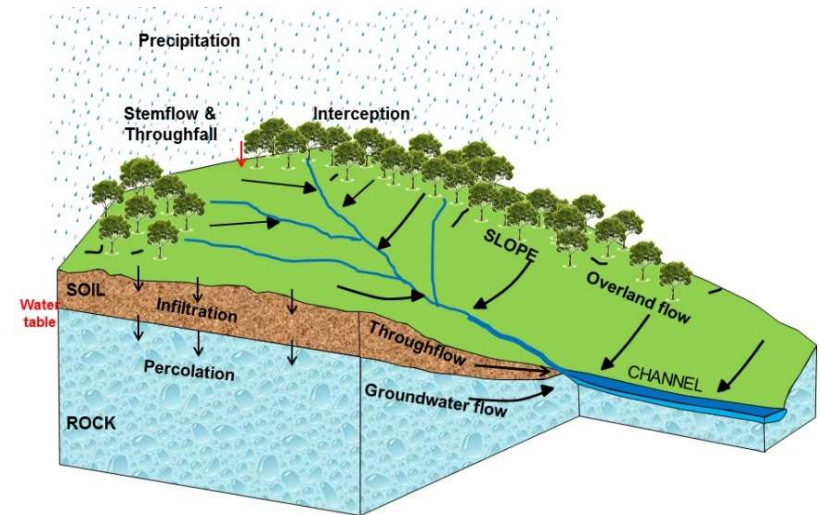


Stormwater System: Maintenance Needs

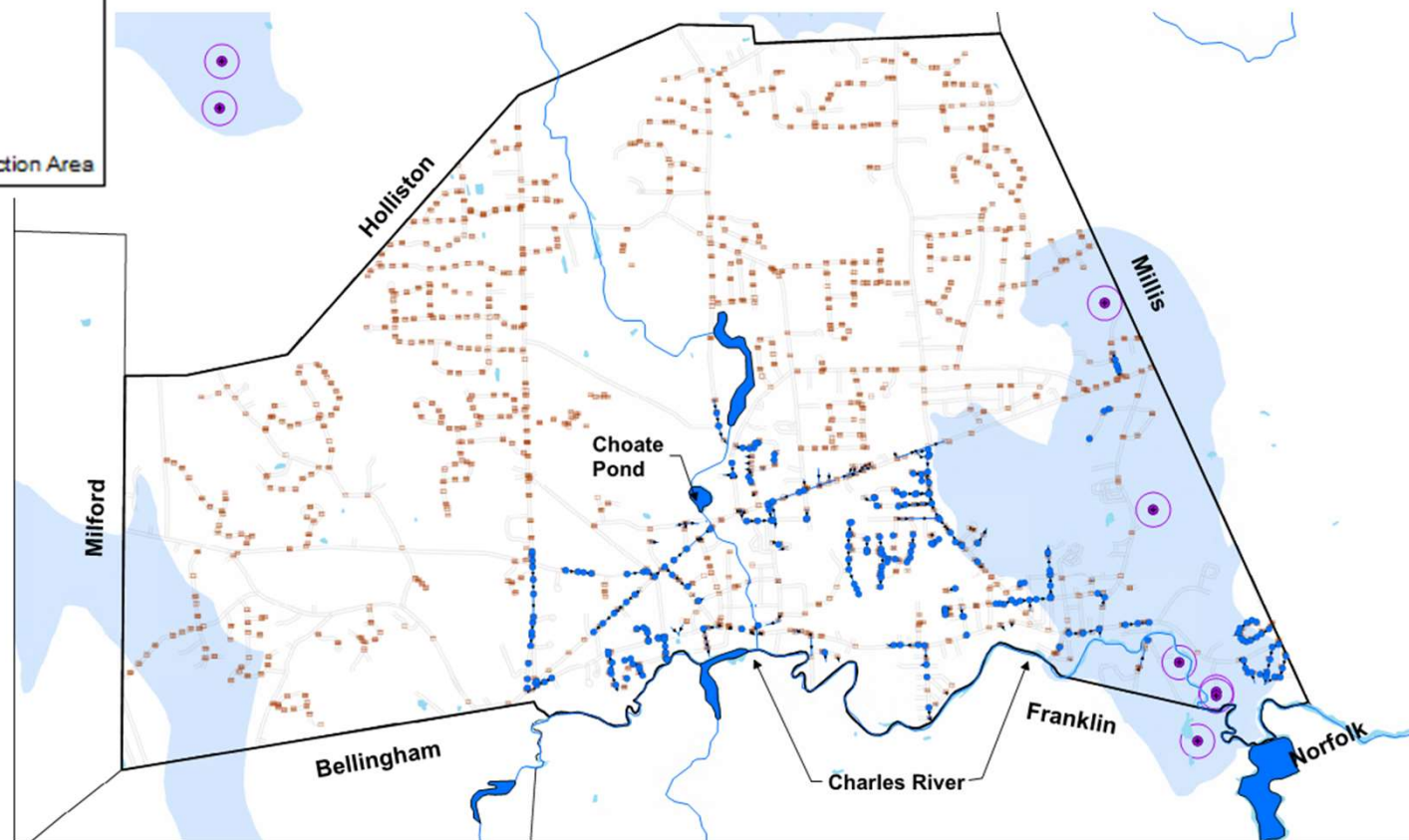


Stormwater Mapping Needs

- Delineate Catchments
- 278 Mapped Outfalls
- Drain System Approx. 20-25% Complete



Stormwater Mapping Needs



Stormwater System: Water Quality Needs

- 278 Outfalls
- Runoff Collects Contaminants from Catchment Area
- Water Quality Monitoring at Outfalls
 - Dry Weather Flow
 - Water Quality Sampling



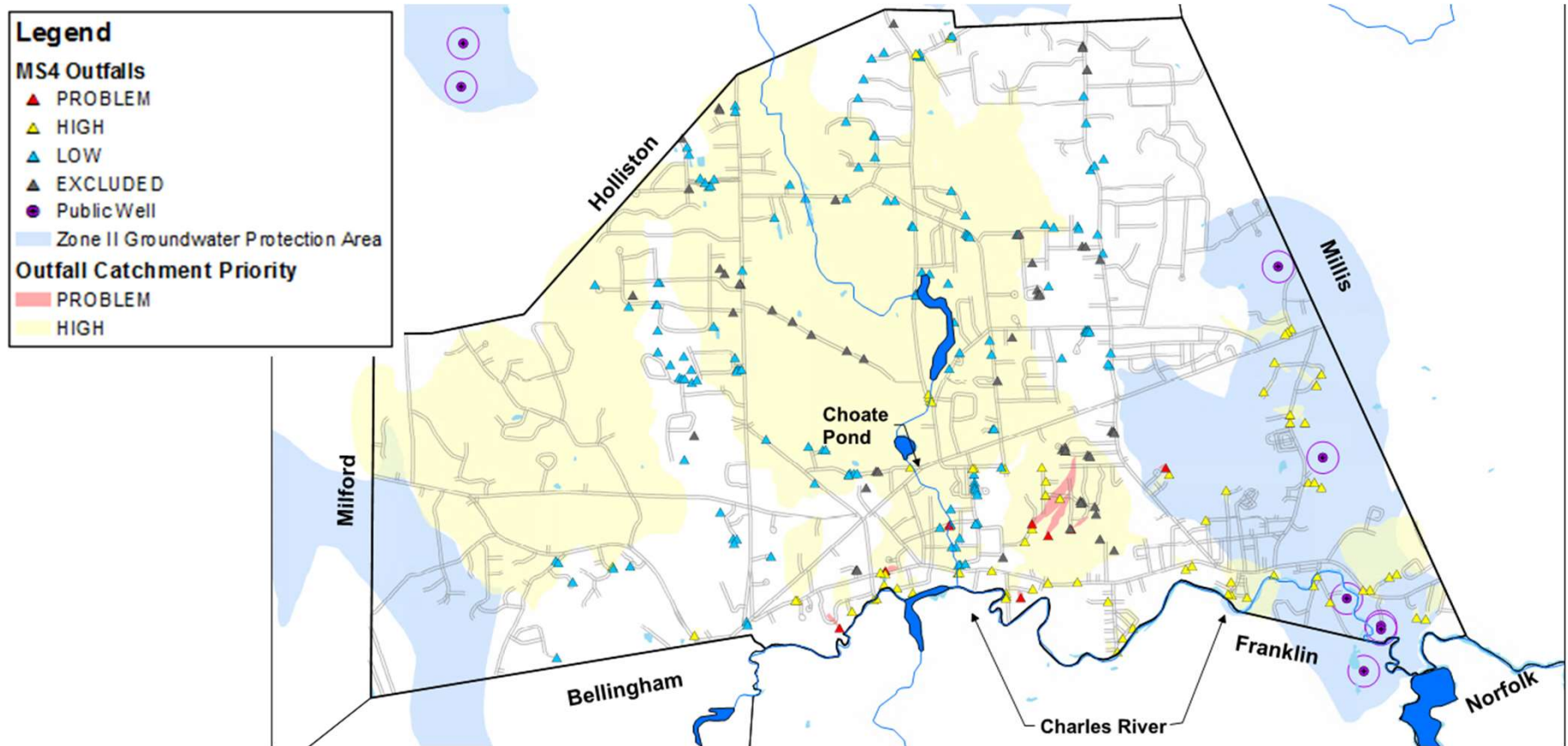
Water Quality Sampling

- Samples are being analyzed for
 - Ammonia
 - Chlorine
 - Conductivity
 - Salinity
 - E. coli or enterococcus
 - Surfactants
 - Temperature
 - Pollutants of concern

What you don't want in the water bodies!



Identification of High Need Catchments (Water Quality)



Water Quality Factors for Catchments

- Watershed/Catchment:

- **Watershed Impaired Status**
- **Outfall Direct Discharge**
- Outfall Density
- Age of Surrounding Development
- **Older Industrial Operations (40+ years)**
- Aging/Failing Sewers
- **Density of Failed or Converted Septic Tanks**
- Long Reaches of Culverted Streams

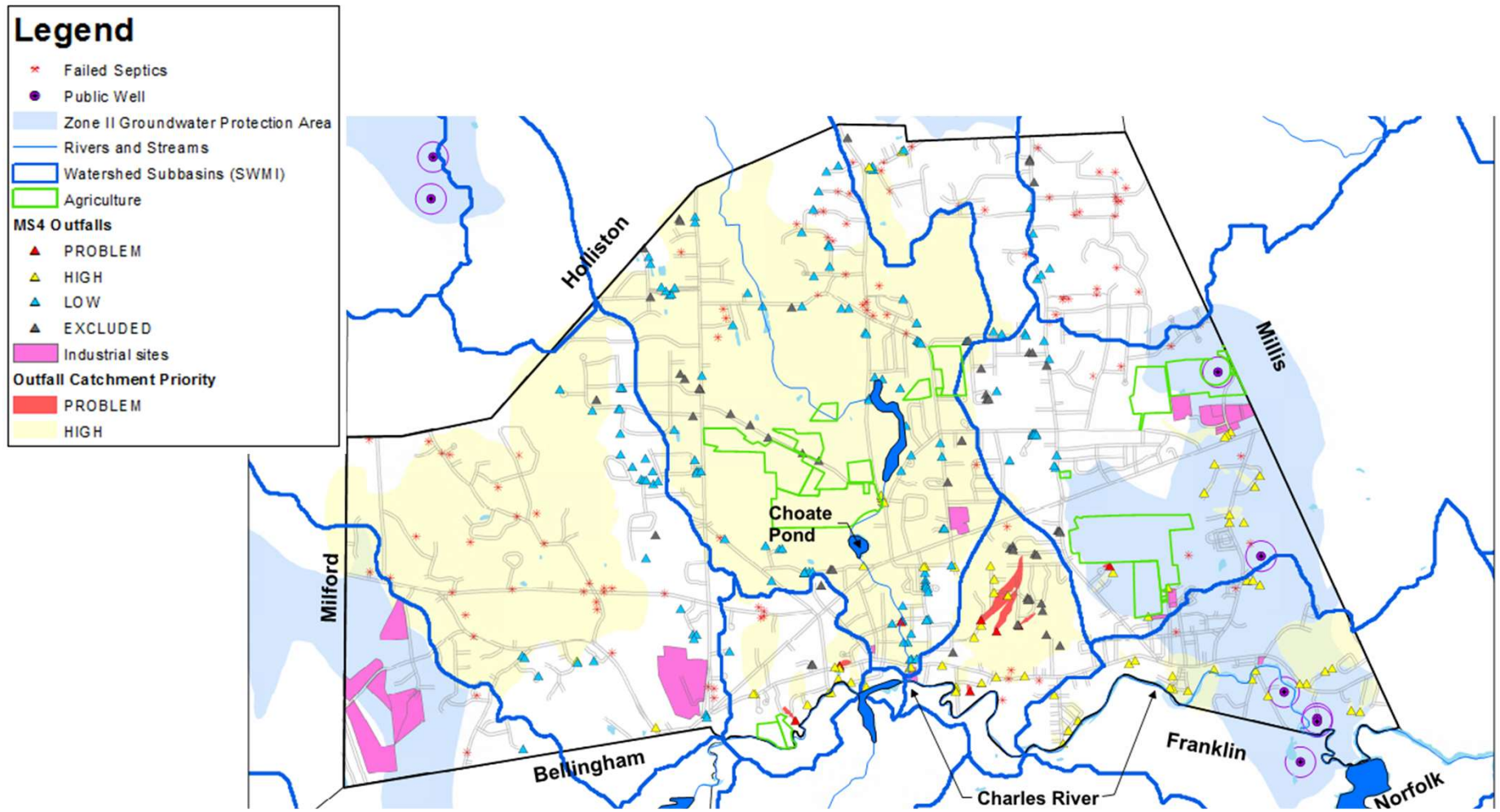
- Public Health:

- **Drinking Water Supplies**
- **Public Beaches**
- **Recreational Areas**

- Suspected Illicit Discharge:

- **Results of Dry Weather Inspections**
- Reports/Complaints

Water Quality Priorities Map



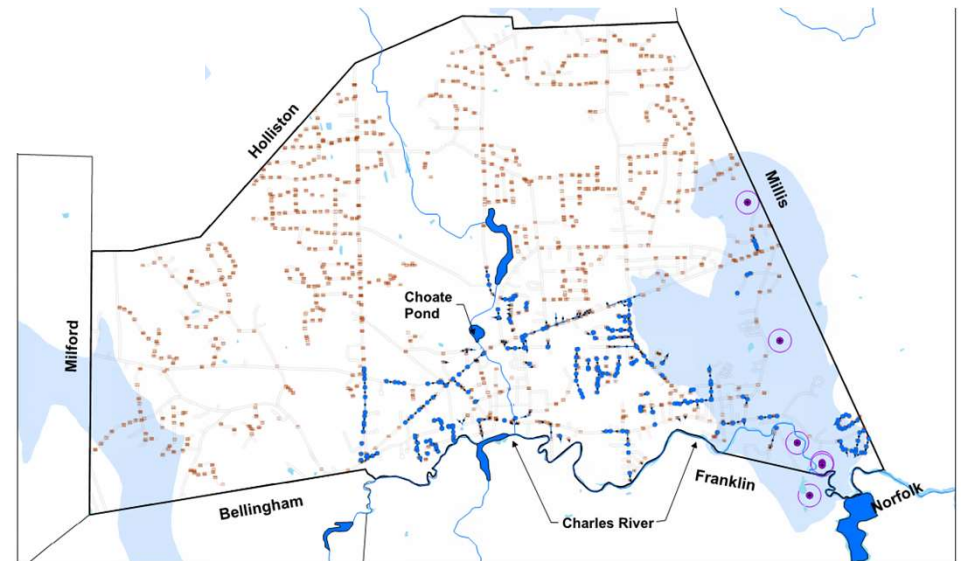
Stormwater Needs Summary

- Maintenance (Good Housekeeping)
 - Catch Basin Cleaning
 - Street Sweeping
- Water Quality Solutions
- Public Education (ongoing)
- GIS Mapping of Drain System

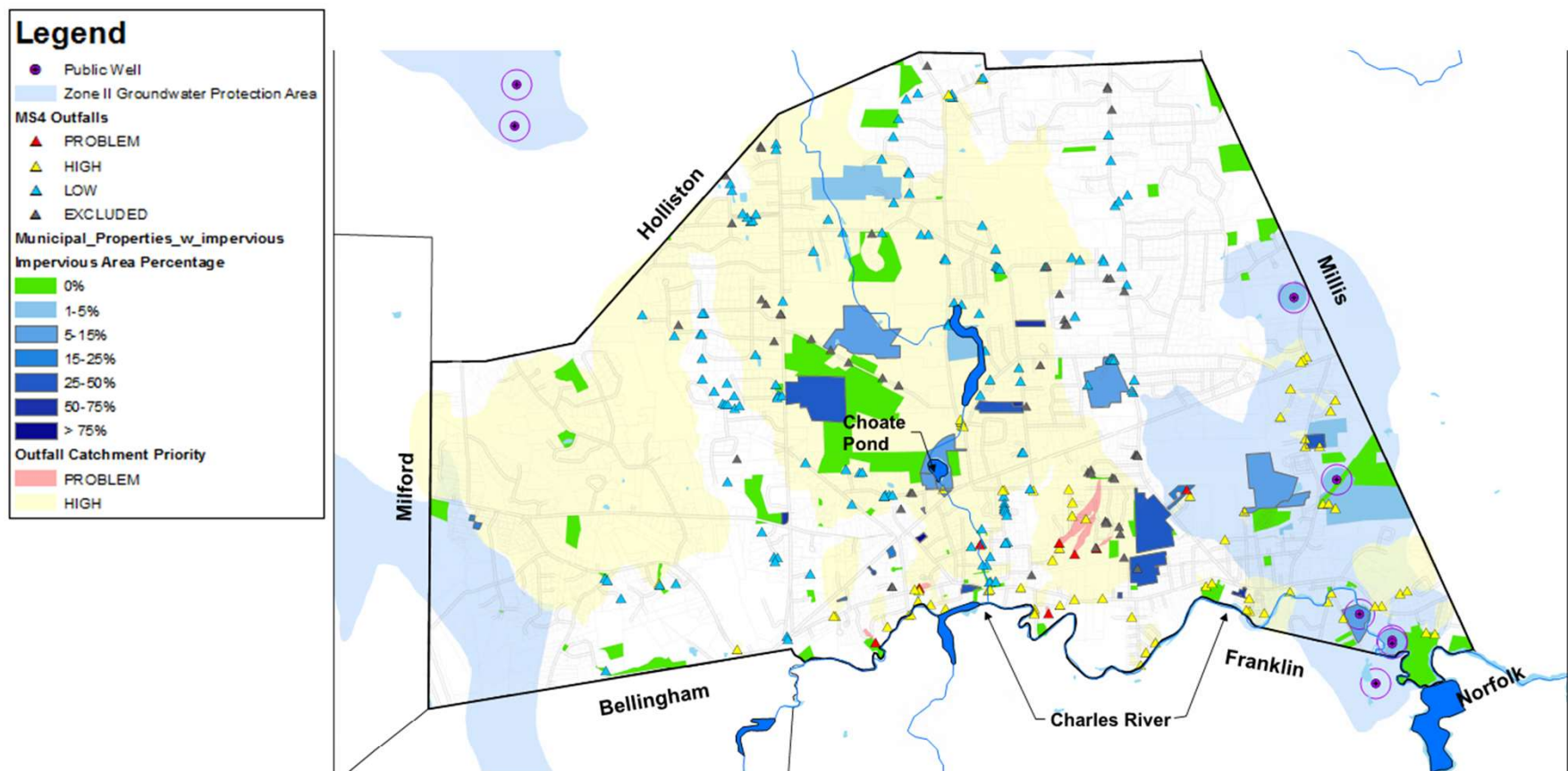


Stormwater System: Data Gaps

- Drain System Mapping
 - Currently 20-25%
 - Identify potential for cross connections



Town Owned Properties for BMP Evaluation



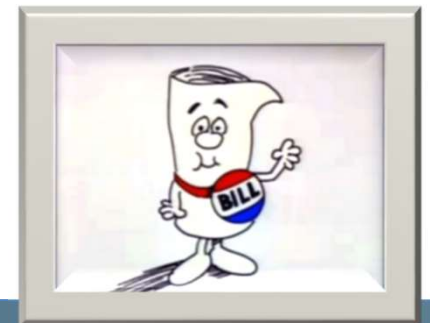
Stormwater Alternative Evaluation (Next Steps)

- Consider Structural Best Management Practices (BMPs) on Town owned parcels
 - Choate Pond
- Map Drain System in Problem and High Concern Catchments
- Identify Improvements



Regulatory Framework – Medway's New Bylaw

- Local By-Law: Article XXVI – Stormwater Management and Land Disturbance
 - Addresses all of the regulatory enforcement provisions required under NPDES MS4 General Permit: Illicit Discharges, Construction Phase Management and Post-Construction Phase Management
 - Has integrated new requirements of the 2017 MS4 GP (e.g. retain 1" of run-off volume and 90% of TSS)



...and about that MS4 General Permit

- EPA has reportedly agreed to “stay” the effective date of the Permit pending legal appeal
- This is an administrative action – not part of the legal process
- Original MA Petitioners’ appeal was related to WQBEL and meeting water quality standards; broader action also appeals the MEP standard (6 MCMs)



Next Steps Summary

