

WATER/WASTEWATER MASTER PLANS



where quality meets life

PFLUGERVILLE
TEXAS

JANUARY 6, 2020

SCOPE OF WORK

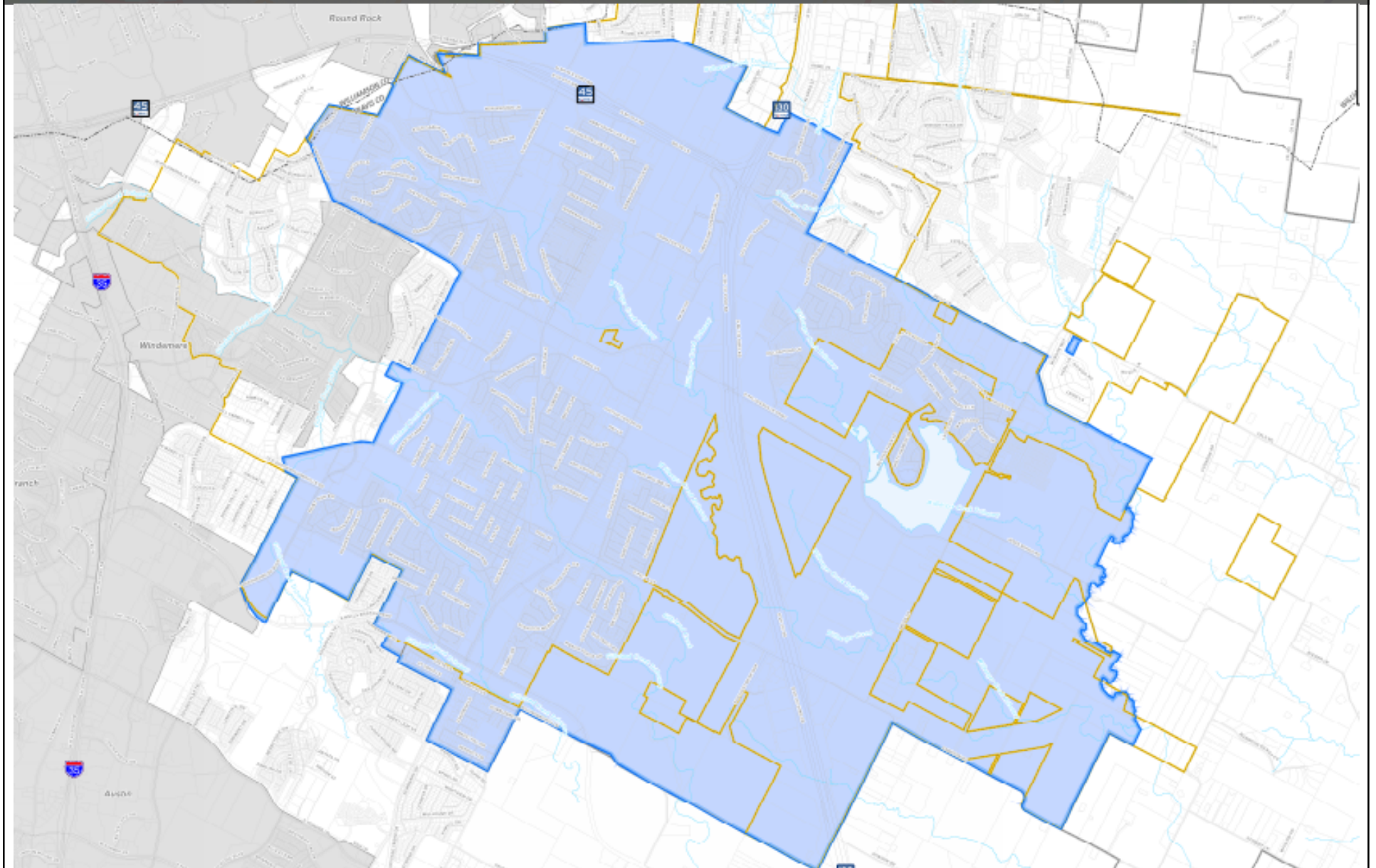
Water Master Plan

- Land Use Assumptions
- Water Model Update and Calibration
- Tank Condition Assessment
- Water System Analyses and Improvements
- Water CIP and Master Plan Report

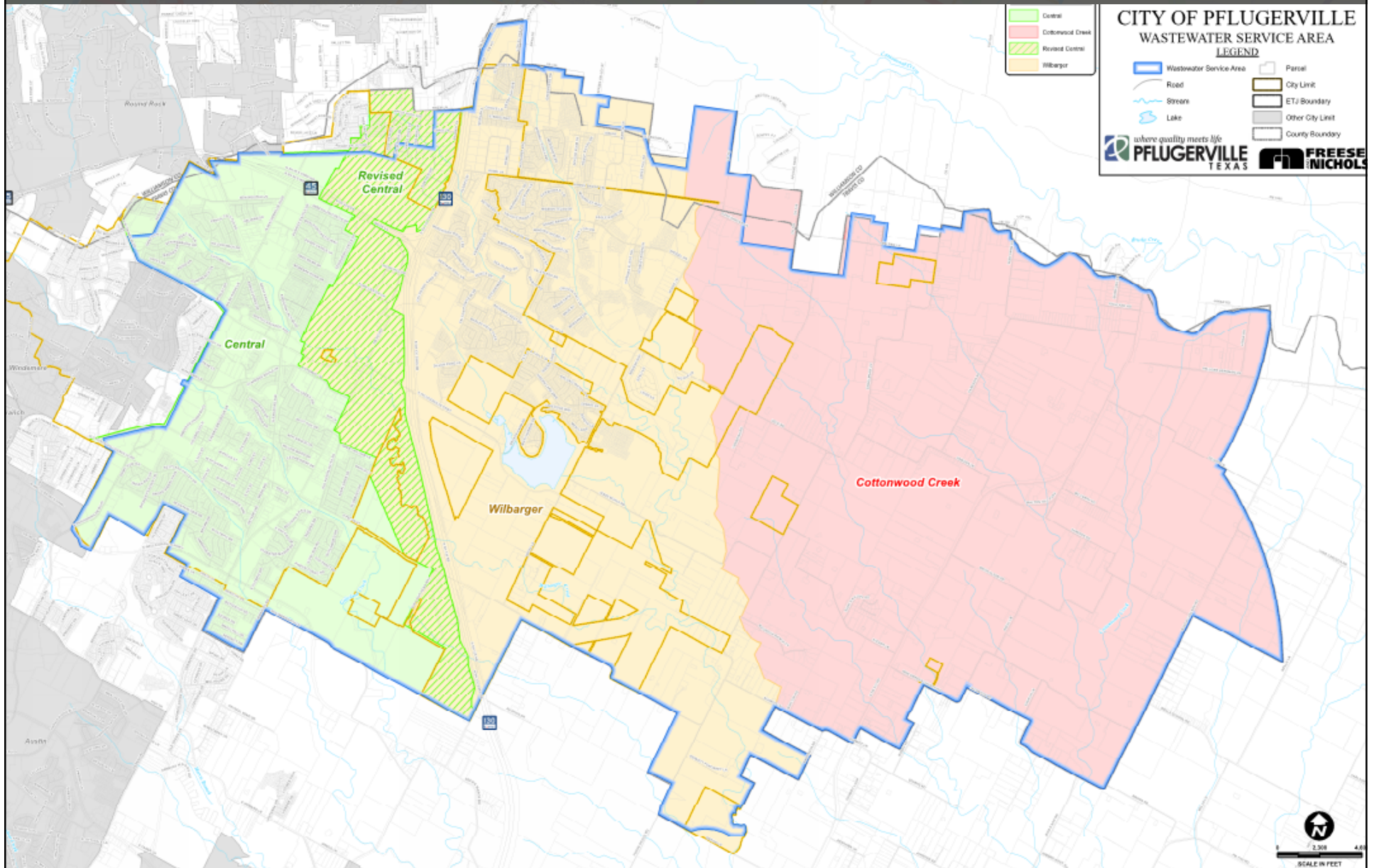
Wastewater Master Plan

- Flow Projections
- Wastewater Model Development and Calibration
- Wastewater System Asset Management
- Wastewater System Analyses and Improvements
- Wastewater CIP and Master Plan Report

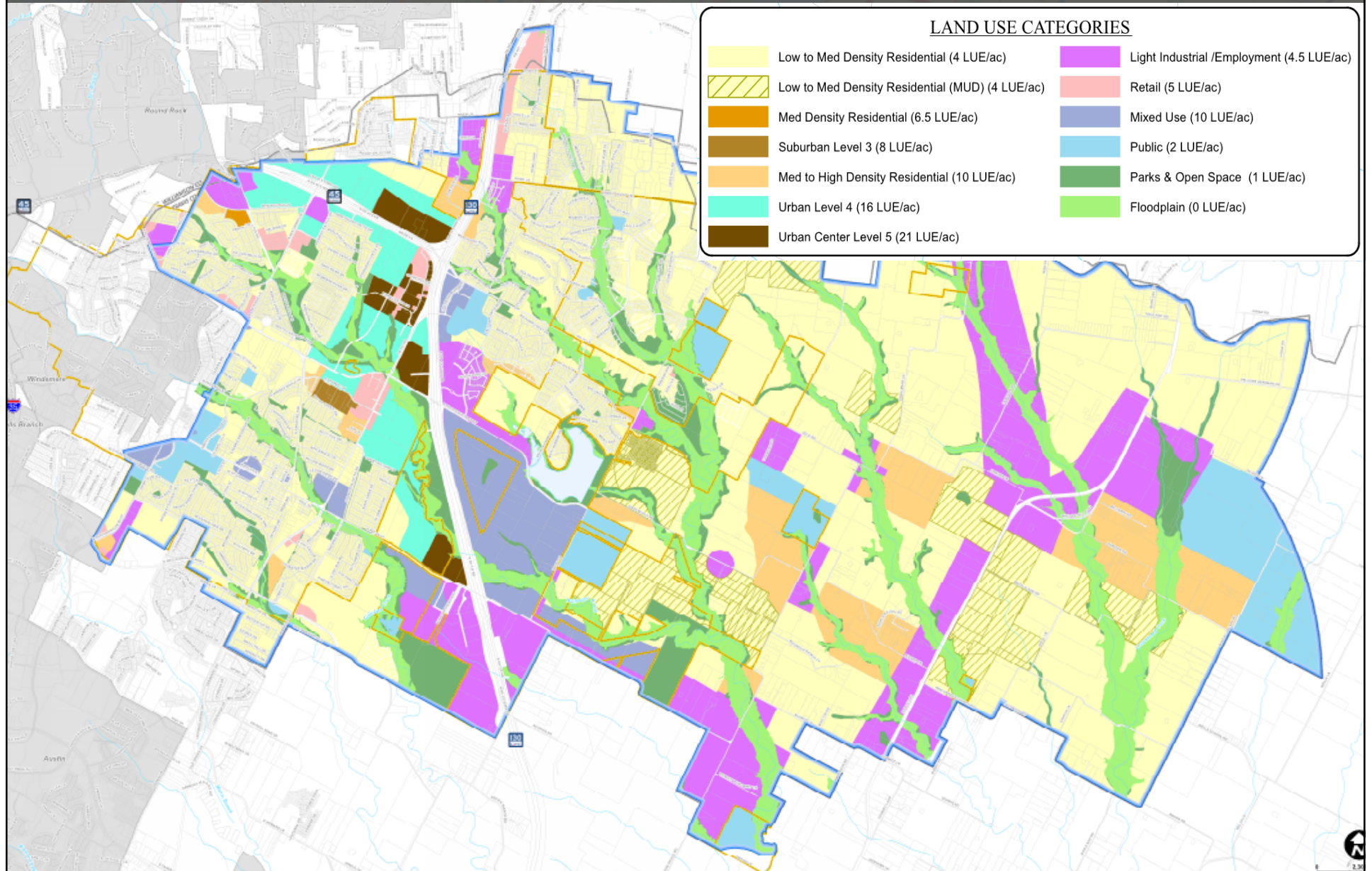
WATER SERVICE AREA



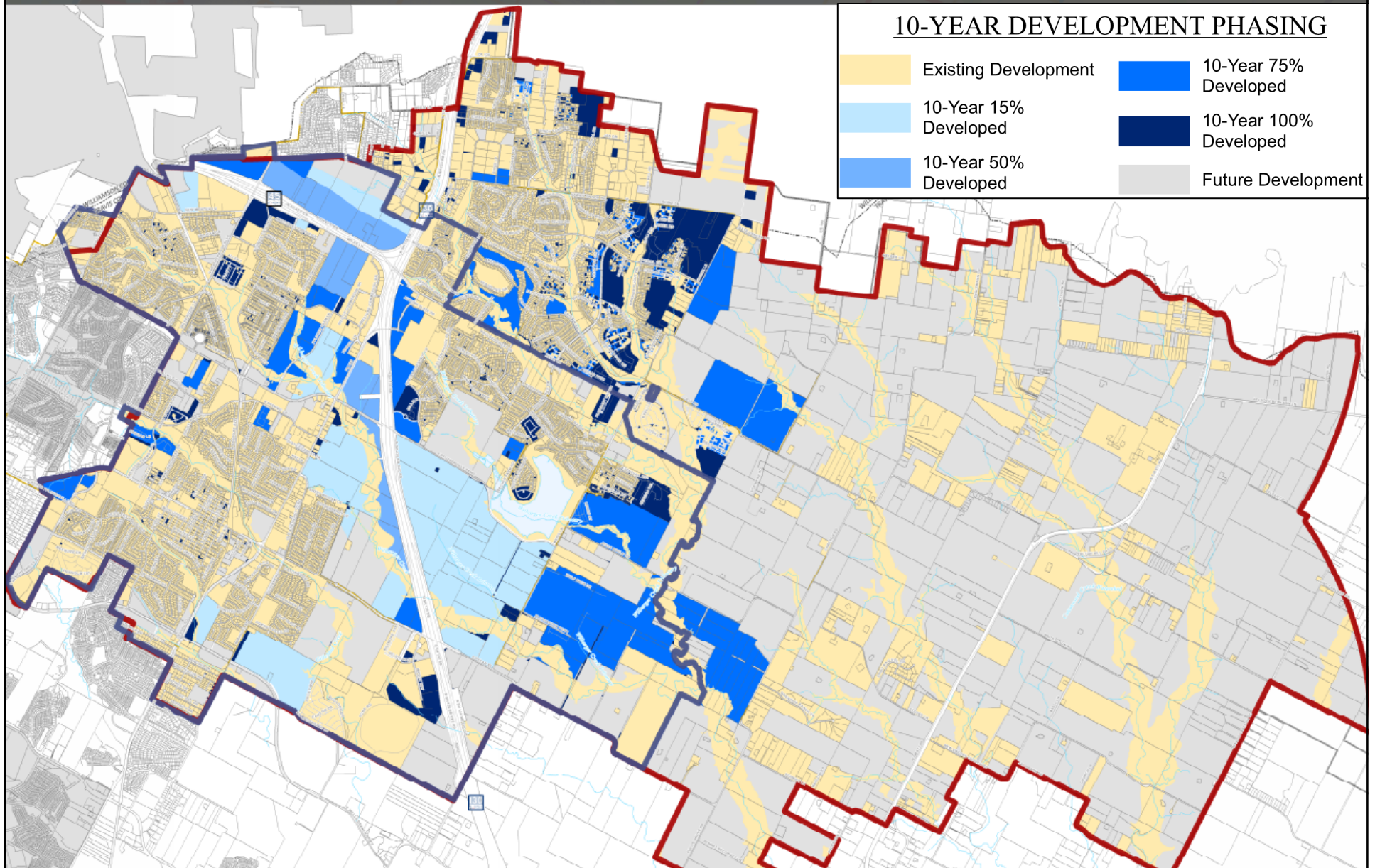
WASTEWATER SERVICE AREA



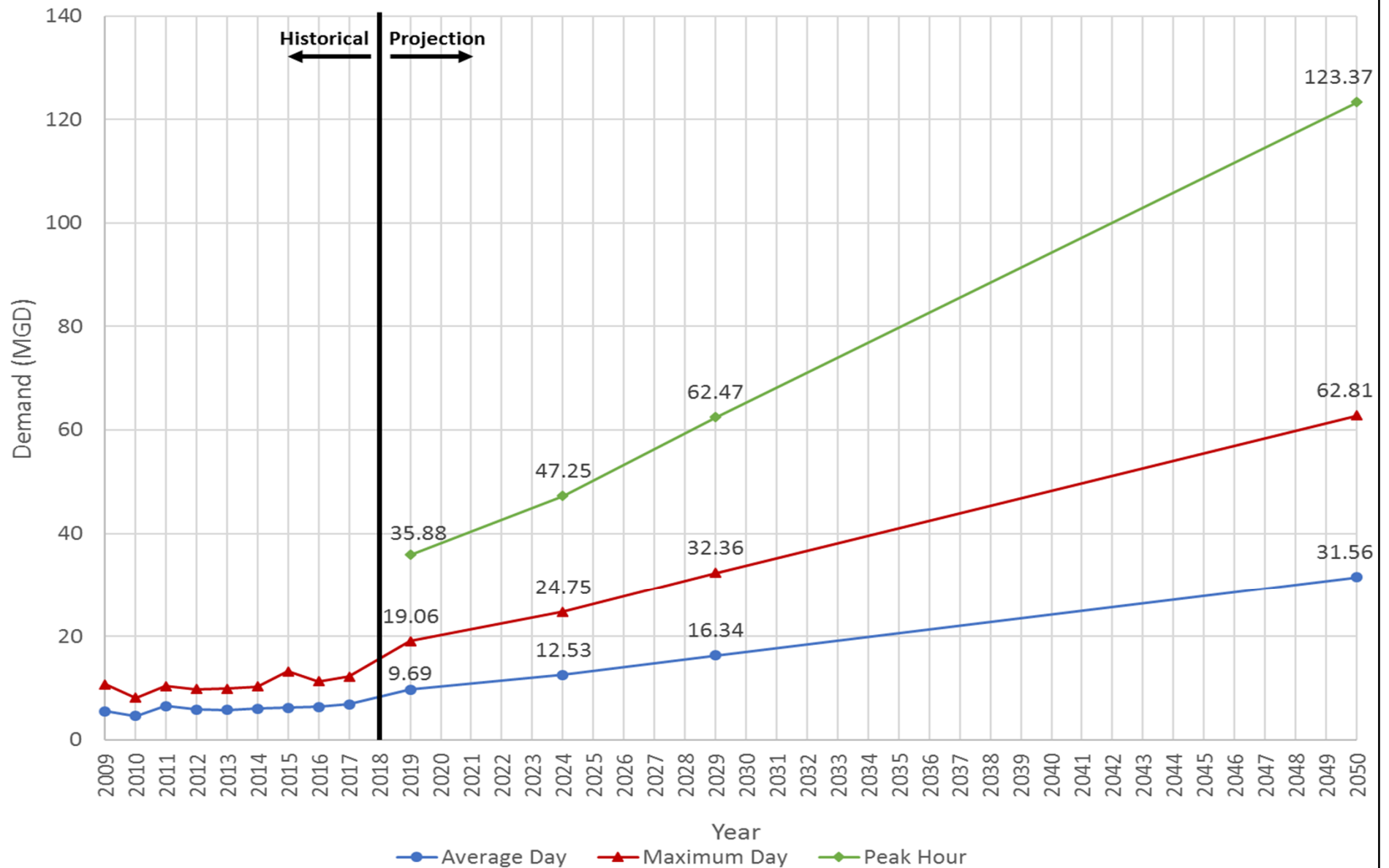
FUTURE LAND USE



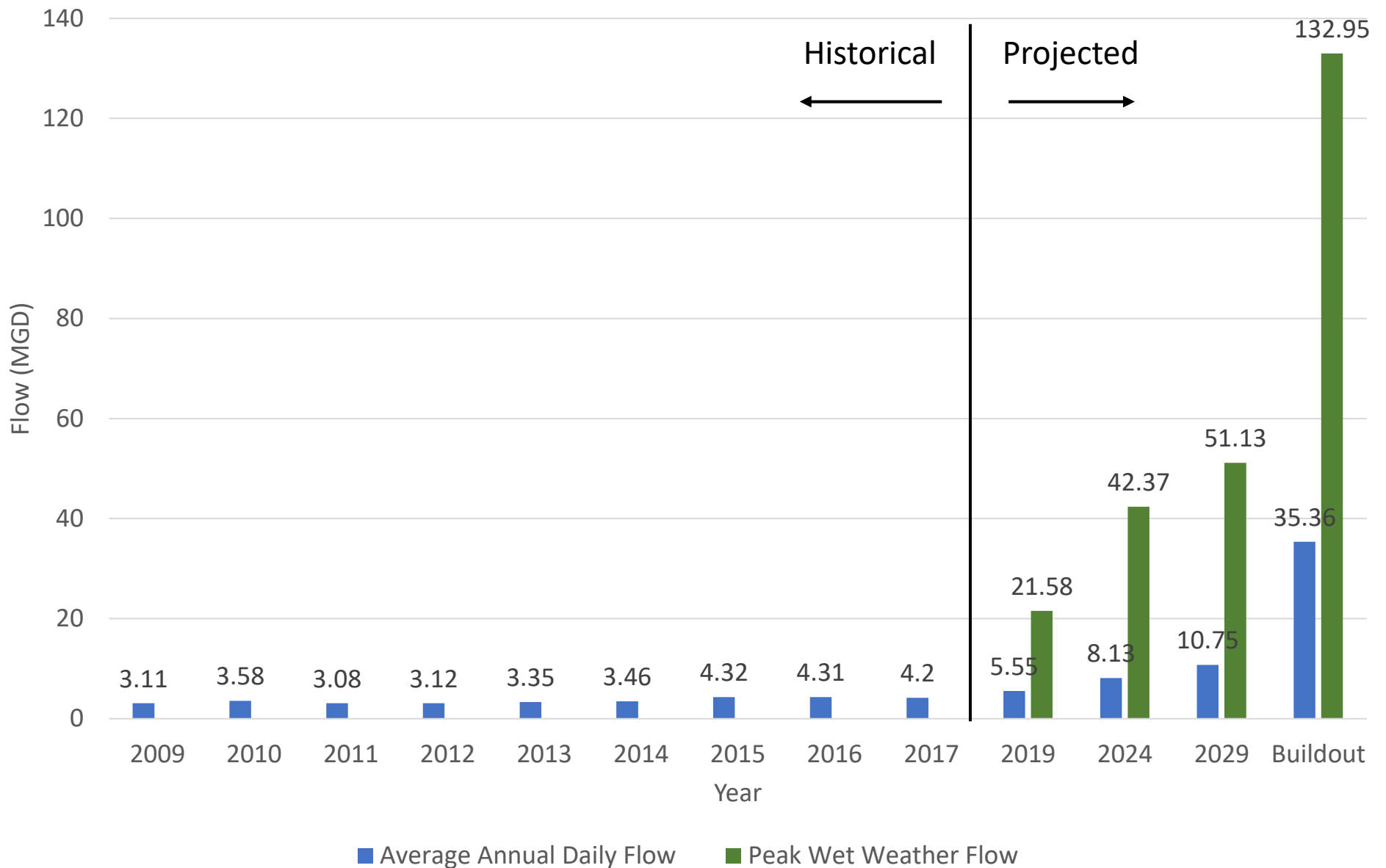
10-YEAR GROWTH AREAS



WATER DEMAND PROJECTIONS



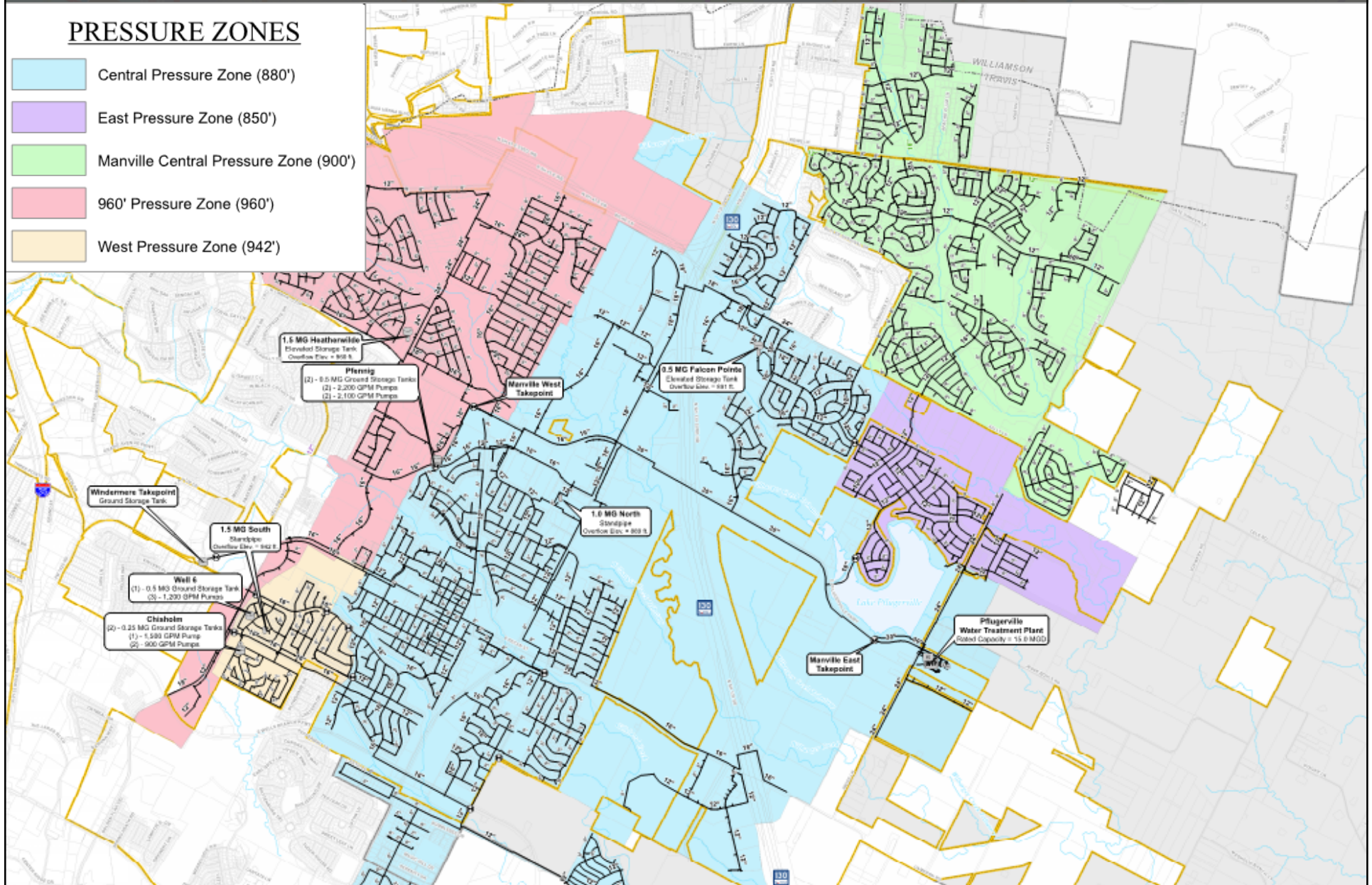
WASTEWATER FLOW PROJECTIONS



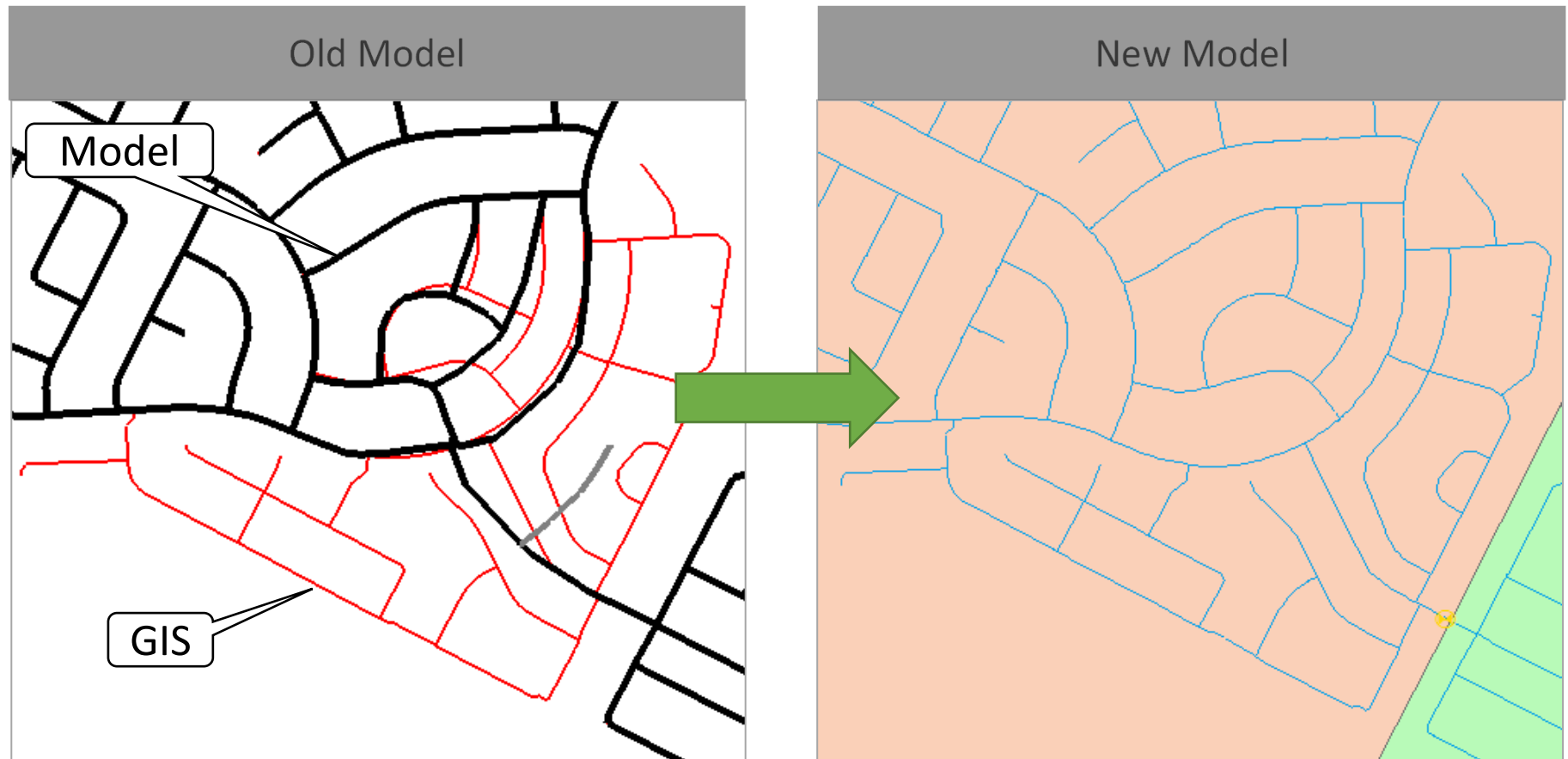
EXISTING WATER SYSTEM

PRESSURE ZONES

- Central Pressure Zone (880')
- East Pressure Zone (850')
- Manville Central Pressure Zone (900')
- 960' Pressure Zone (960')
- West Pressure Zone (942')



WATER MODEL UPDATE

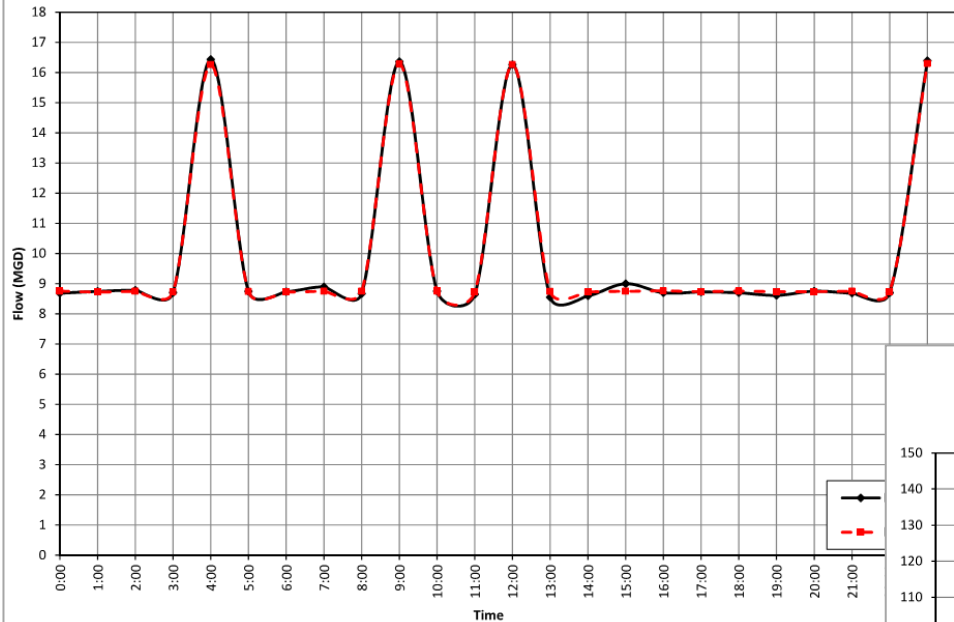


PRESSURE TESTING

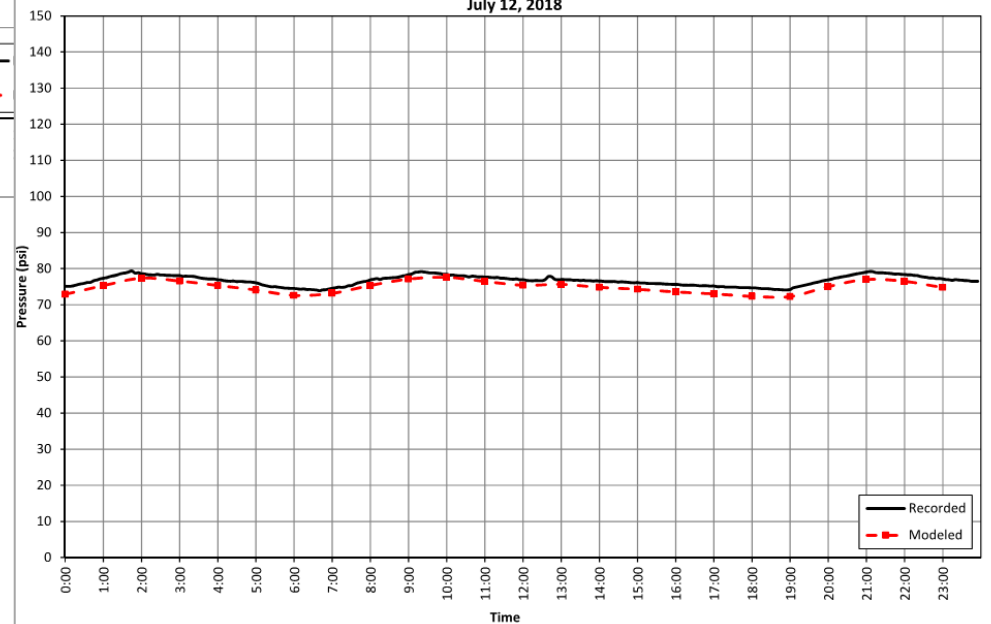


WATER MODEL CALIBRATION

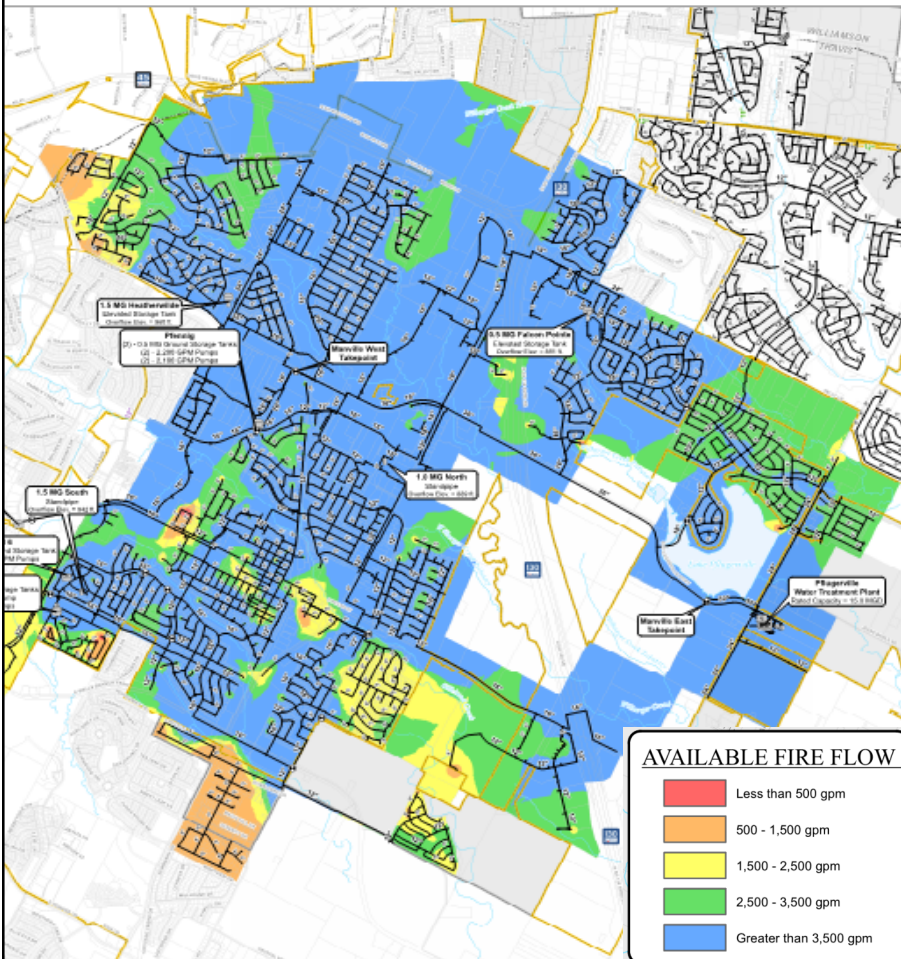
City of Pflugerville
PFL Water Treatment Plant Flow
July 12, 2018



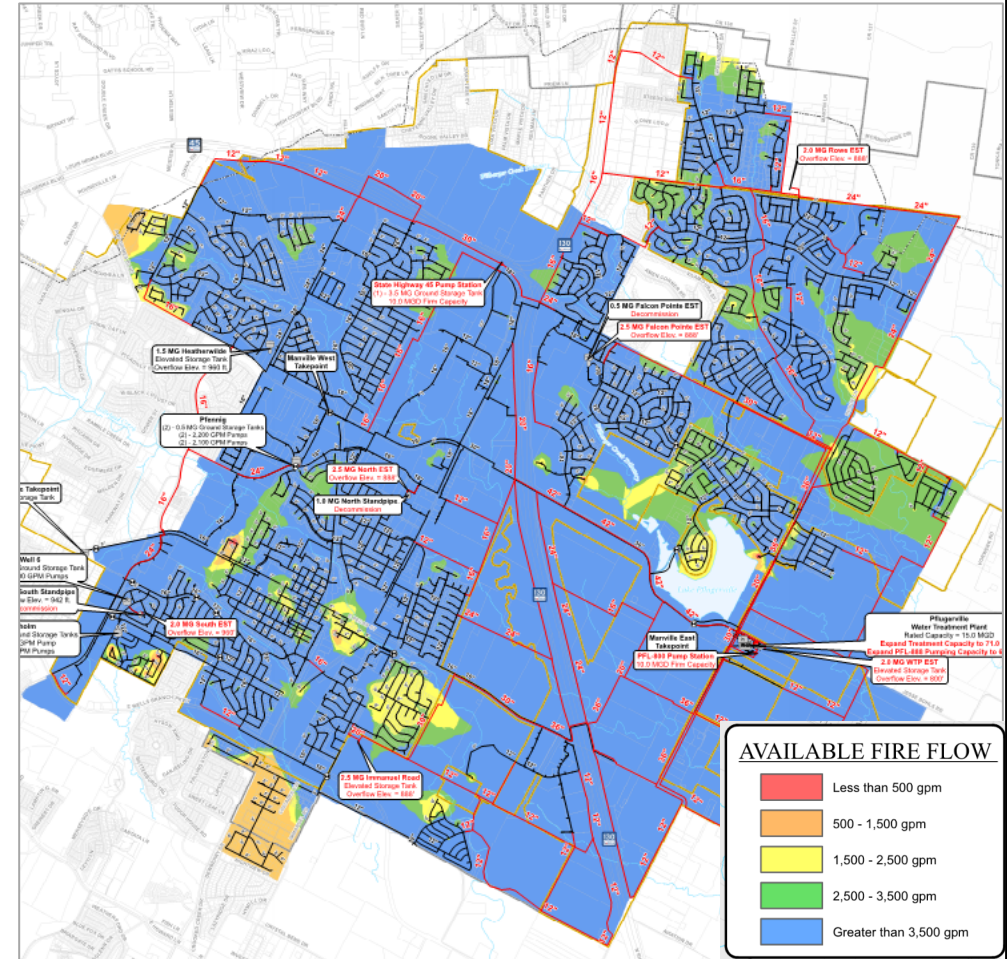
City of Pflugerville
Location #5: 600 Smoke Signal Pass
Elevation: 752 ft
July 12, 2018



WATER SYSTEM ANALYSES

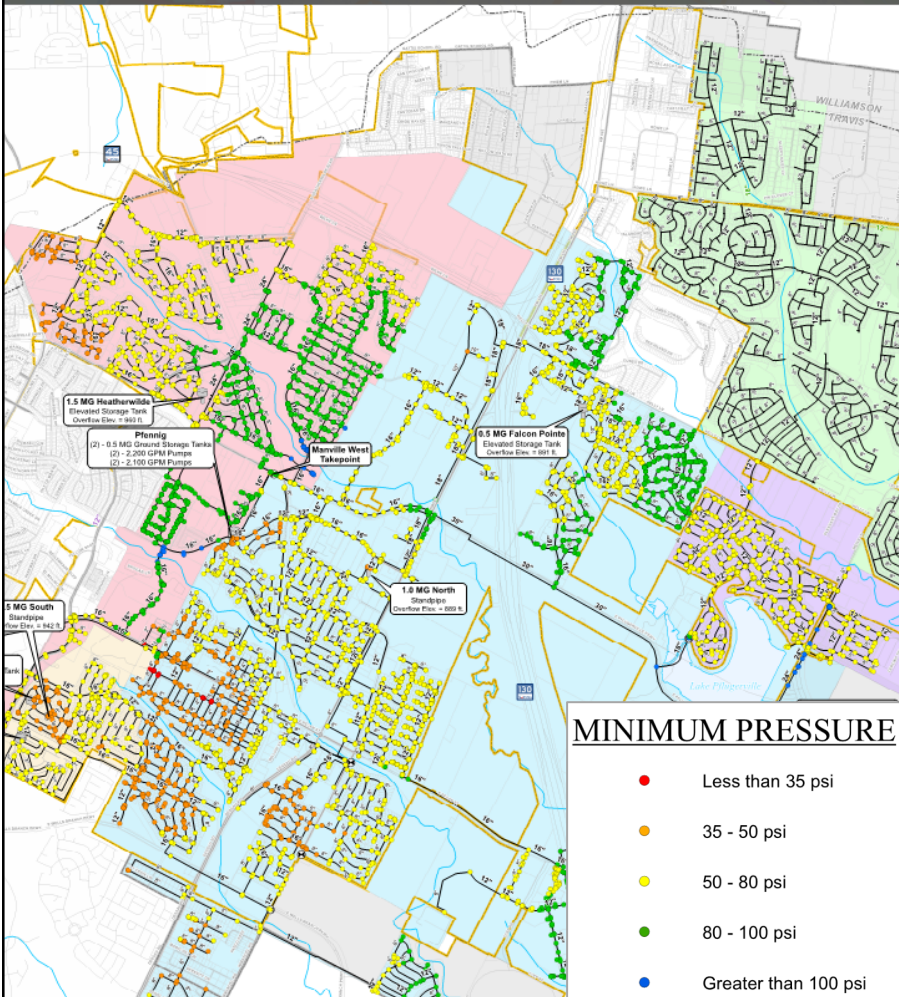


Existing System Fire Flow Analysis

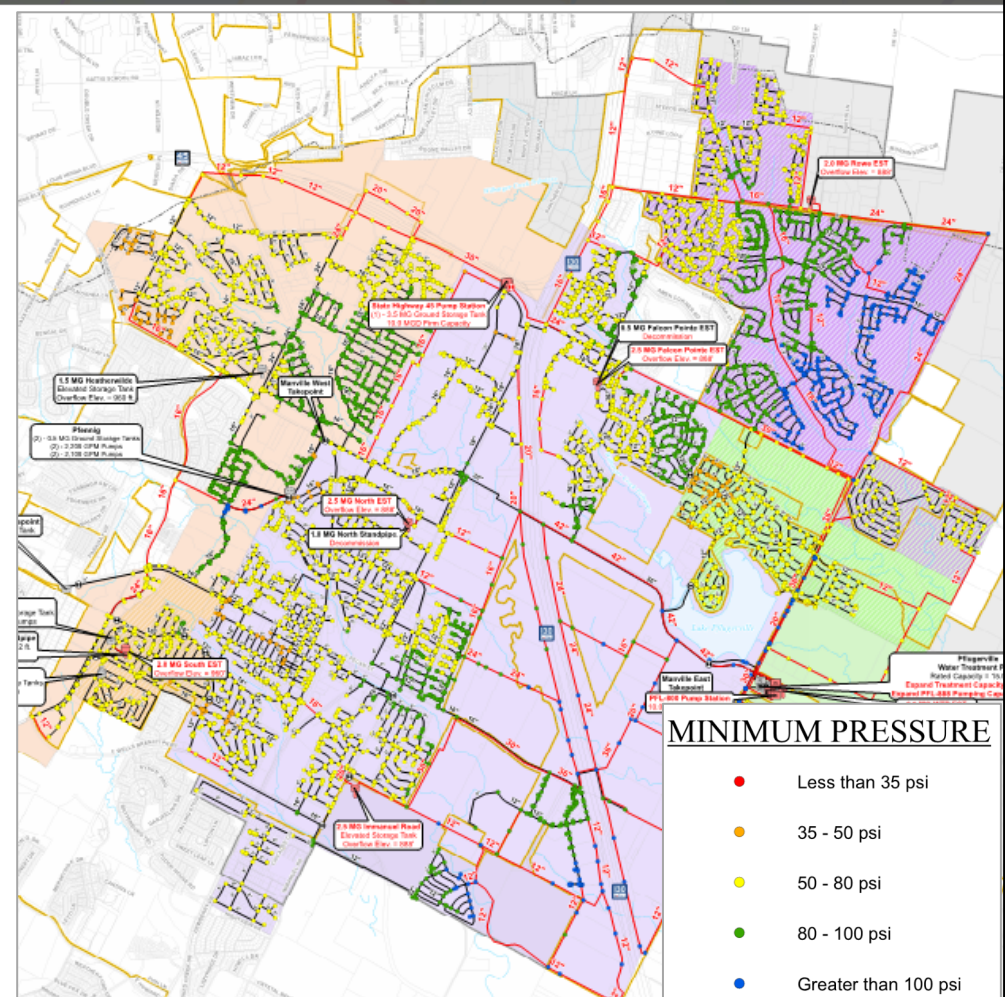


Buildout System Fire Flow Analysis

WATER SYSTEM ANALYSES

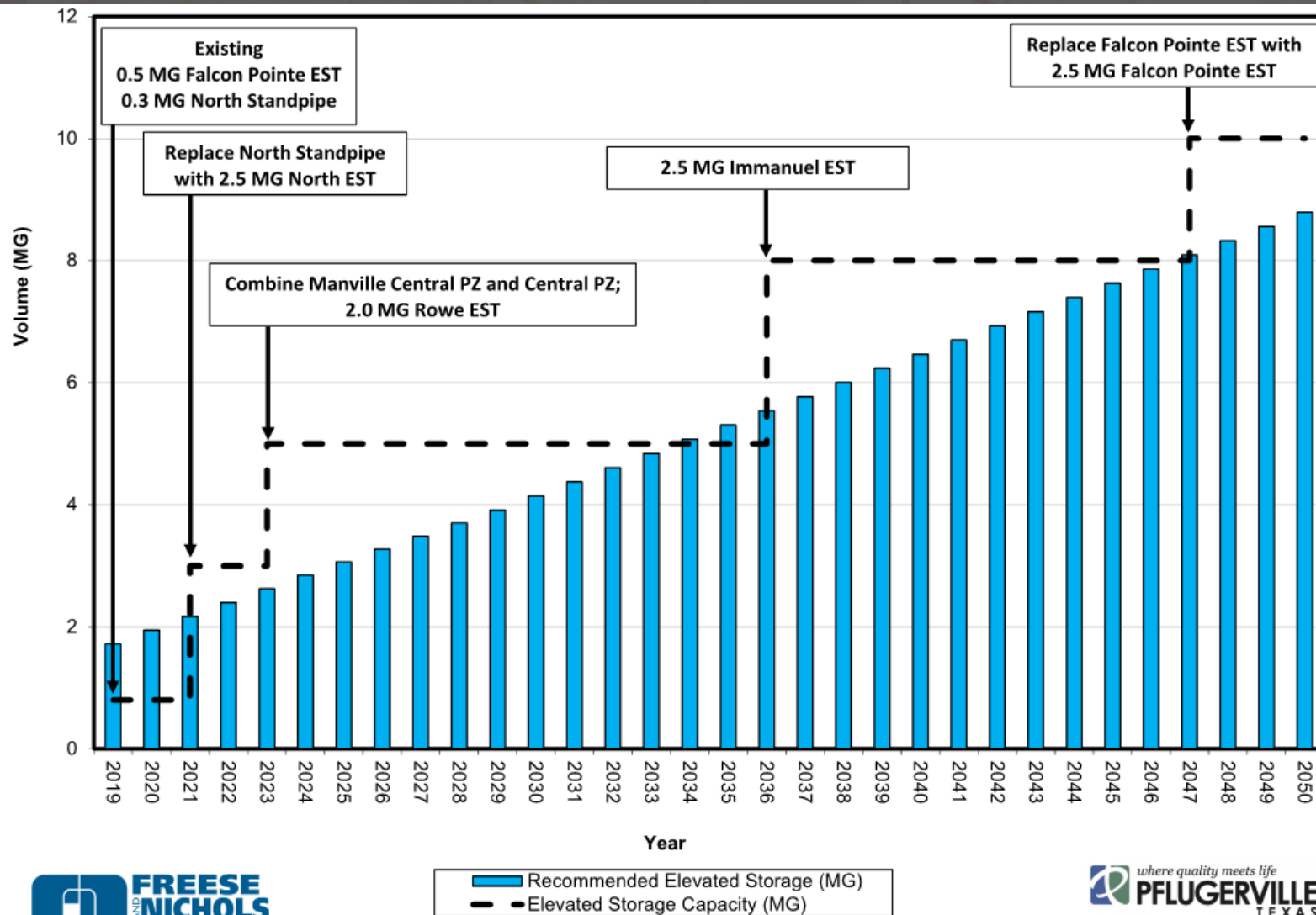


Existing System Minimum Pressures



Buildout System Minimum Pressures

PUMPING AND STORAGE



Central Pressure Zone Elevated Storage Recommendations

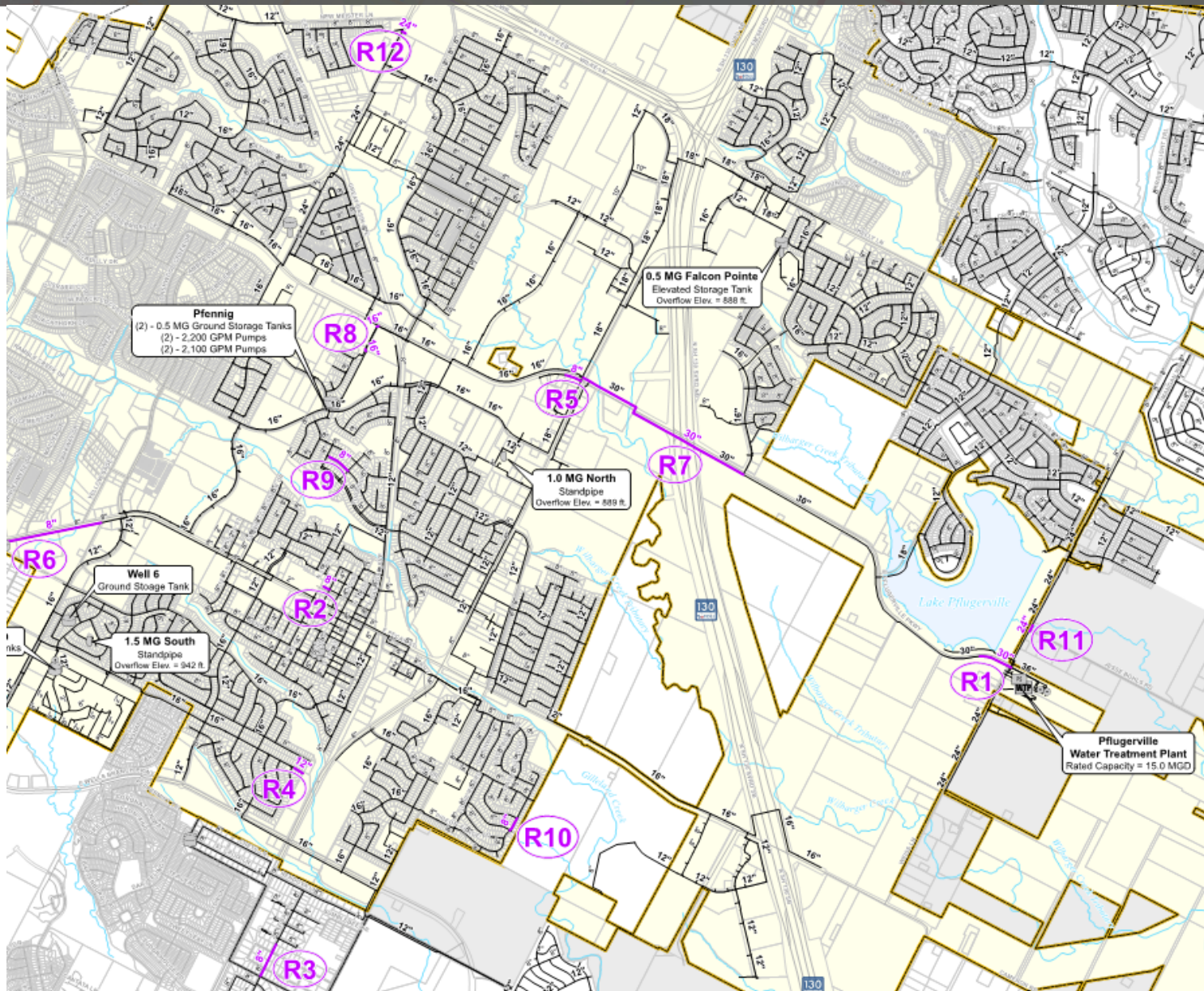
WATER SYSTEM ASSET MANAGEMENT

Risk Rating = Condition + Criticality		Condition Ranking				
		Very Good	Good	Fair	Poor	Very Poor
Criticality Ranking	Very Low Impact					Well 6 GST Chisholm GST #1 Chisholm GST #2
	Low Impact					
	Moderate Impact		Pfennig GST #1 Pfennig GST #2			North Standpipe
	High Impact		Surface WTP GST #2	Surface WTP GST #1		Windermere GST South Standpipe
	Very High Impact					

WATER SYSTEM ASSET MANAGEMENT

Risk Rating = Condition + Criticality		Condition Ranking				
		Very Good	Good	Fair	Poor	Very Poor
Criticality Ranking	Very Low Impact	830,487 LF	72,137 LF	0 LF	10,400 LF	938 LF
	Low Impact	45,350 LF	7,191 LF	0 LF	748 LF	0 LF
	Moderate Impact	9,627 LF	430 LF	0 LF	0 LF	0 LF
	High Impact	171,387 LF	28,257 LF	0 LF	2,222 LF	0 LF
	Very High Impact	5,805 LF	5,768 LF	0 LF	0 LF	848 LF

WATER REHABILITATION CIP



WATER CIP

Under Design/Construction Improvements

Water Line

2019 - 2024 Improvements

Pump Station

Water Treatment Plant

Elevated Storage Tank

Water Line

2025 - 2029 Improvements

Open Valve

Pump Station

Ground Storage Tank

Elevated Storage Tank

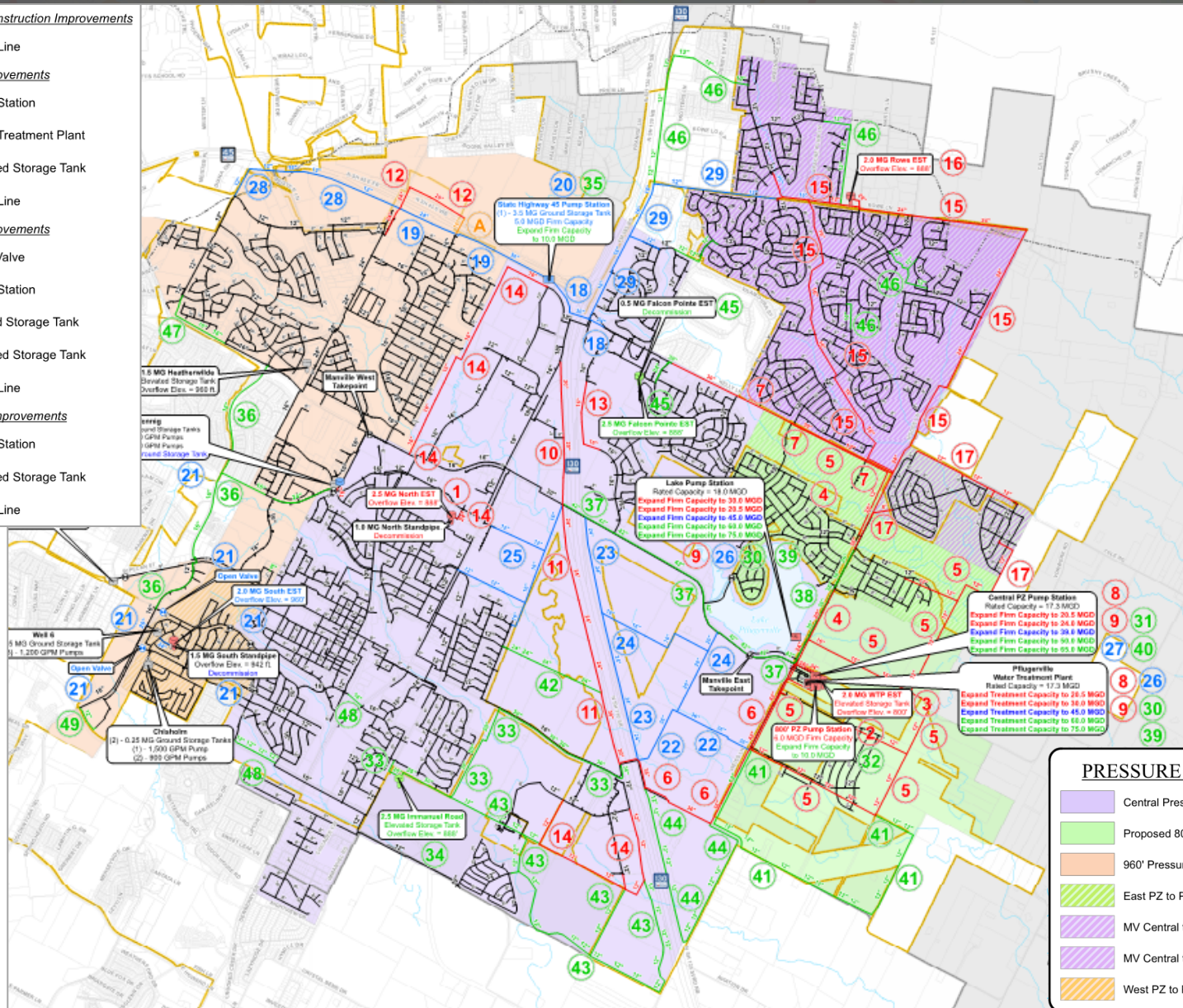
Water Line

2030 - Buildout Improvements

Pump Station

Elevated Storage Tank

Water Line



PRESSURE ZONES

- Central Pressure Zone
- Proposed 800' Pressure Zone
- 960' Pressure Zone
- East PZ to PFL-800
- MV Central to PFL-800
- MV Central to PFL-888
- West PZ to PFL-960

WATER CIP – 5-YEAR HIGHLIGHTS

Under Design/Construction Improvements

Water Line

2019 - 2024 Improvements

Pump Station

Water Treatment Plant

Elevated Storage Tank

Water Line

2025 - 2029 Improvements

Open Valve

Pump Station

Ground Storage Tank

Elevated Storage Tank

Water Line

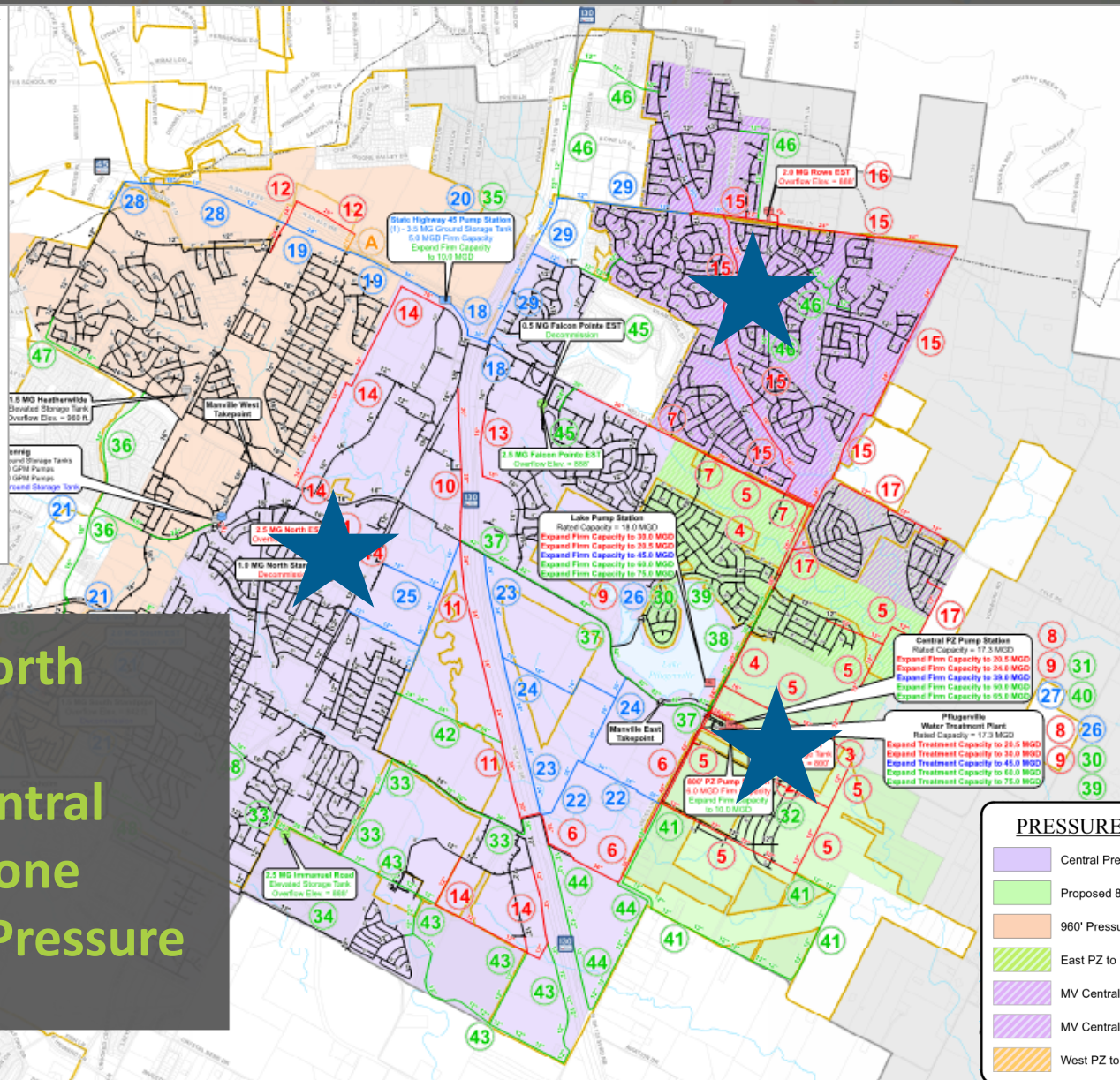
2030 - Buildout Improvements

Pump Station

Elevated Storage Tank

Water Line

- Replace North Standpipe
- Expand Central Pressure Zone
- New 800' Pressure Zone







PRESSURE ZONES

- Central Pressure Zone
- Proposed 800' Pressure Zone
- 960' Pressure Zone
- East PZ to PFL-800
- MV Central to PFL-800
- MV Central to PFL-888
- West PZ to PFL-960






WATER CIP – 10-YEAR HIGHLIGHTS

Under Design/Construction Improvements




2019 - 2024 Improvements

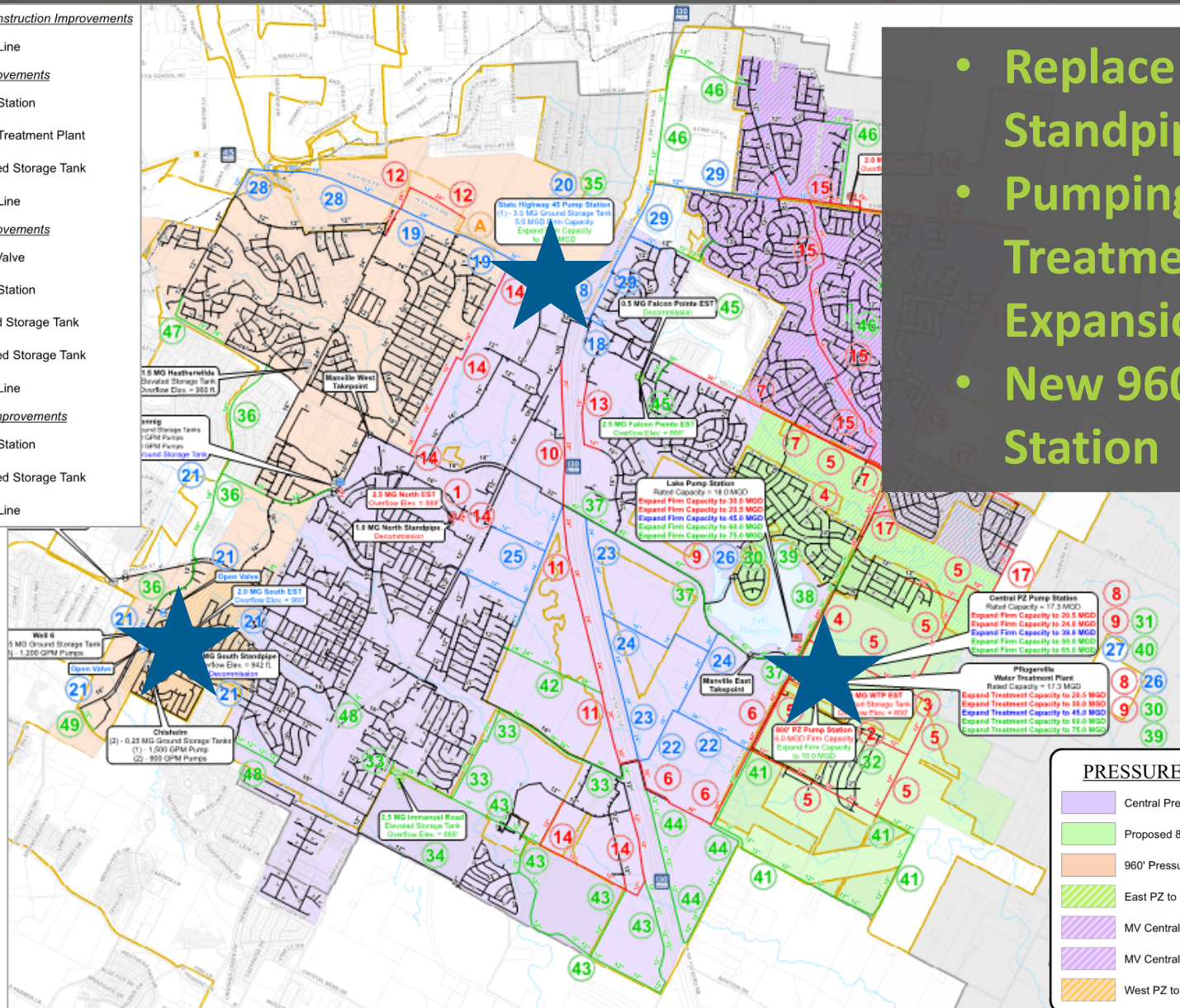
-  Pump Station
-  Water Treatment Plant
-  Elevated Storage Tank
-  Water Line

2025 - 2029 Improvements

-  Open Valve
-  Pump Station
-  Ground Storage Tank
-  Elevated Storage Tank
-  Water Line








2030 - Buildout Improvements

-  Pump Station
-  Elevated Storage Tank
-  Water Line



- Replace South Standpipe
- Pumping and Treatment Expansions
- New 960' Pump Station





PRESSURE ZONES

-  Central Pressure Zone
-  Proposed 800' Pressure Zone
-  960' Pressure Zone
-  East PZ to PFL-800
-  MV Central to PFL-800
-  MV Central to PFL-888
-  West PZ to PFL-960






WATER CIP – BUILDOUT HIGHLIGHTS

Under Design/Construction Improvements




2019 - 2024 Improvements

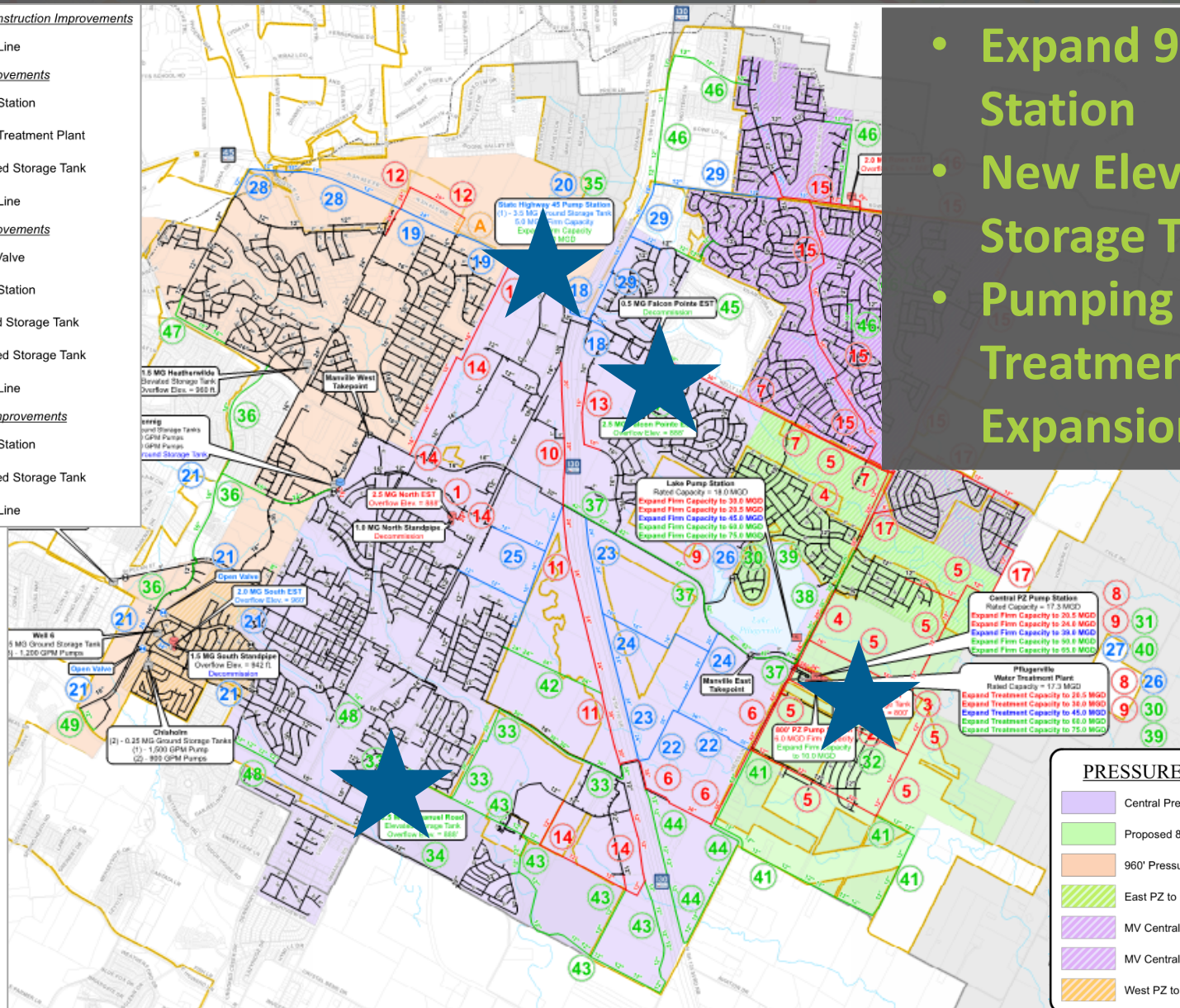
-  Pump Station
-  Water Treatment Plant
-  Elevated Storage Tank
-  Water Line

2025 - 2029 Improvements

-  Open Valve
-  Pump Station
-  Ground Storage Tank
-  Elevated Storage Tank
-  Water Line








2030 - Buildout Improvements

-  Pump Station
-  Elevated Storage Tank
-  Water Line



- Expand 960' Pump Station
- New Elevated Storage Tanks
- Pumping and Treatment Expansions

PRESSURE ZONES

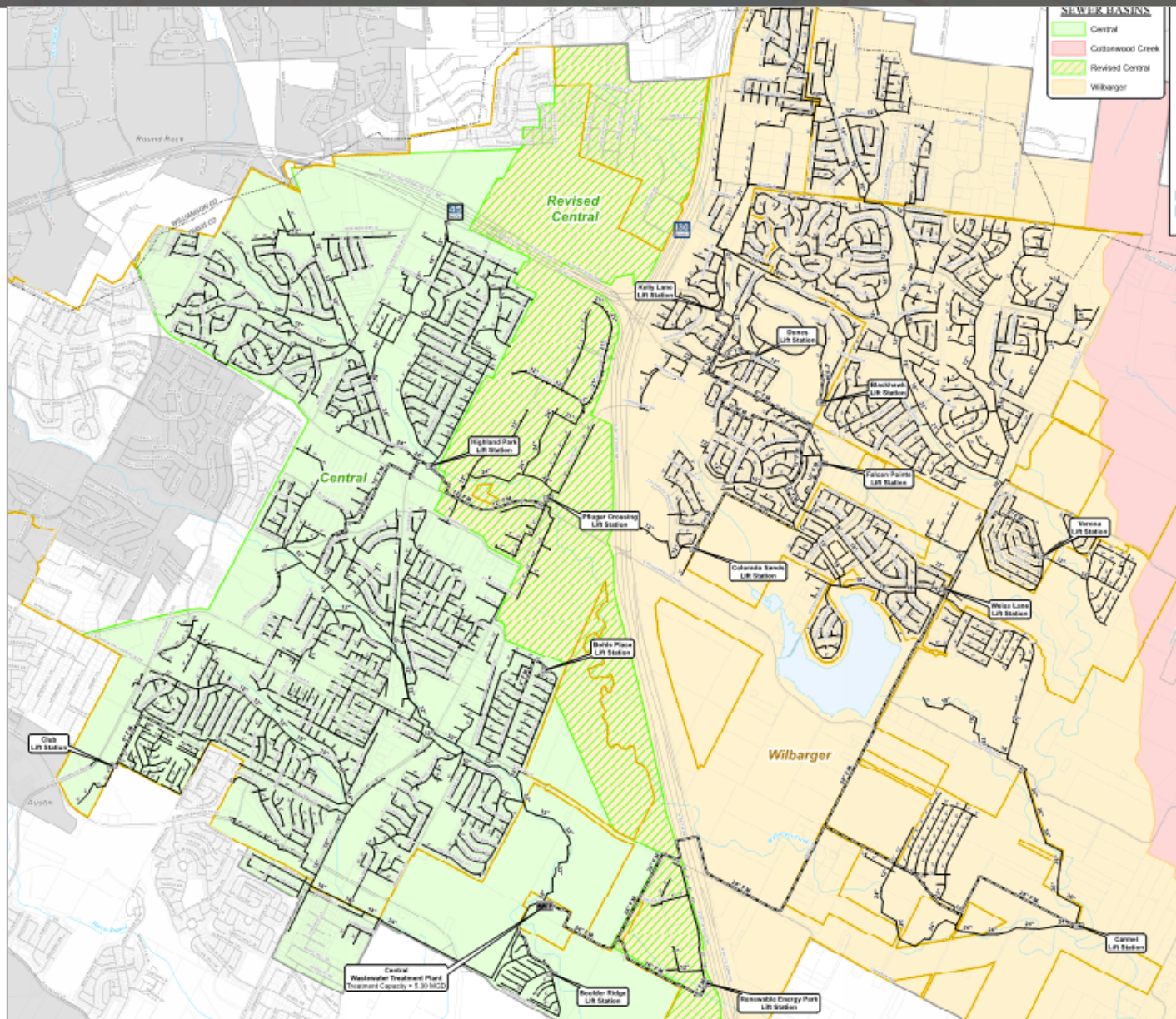
-  Central Pressure Zone
-  Proposed 800' Pressure Zone
-  960' Pressure Zone
-  East PZ to PFL-800
-  MV Central to PFL-800
-  MV Central to PFL-888
-  West PZ to PFL-960

WATER CIP

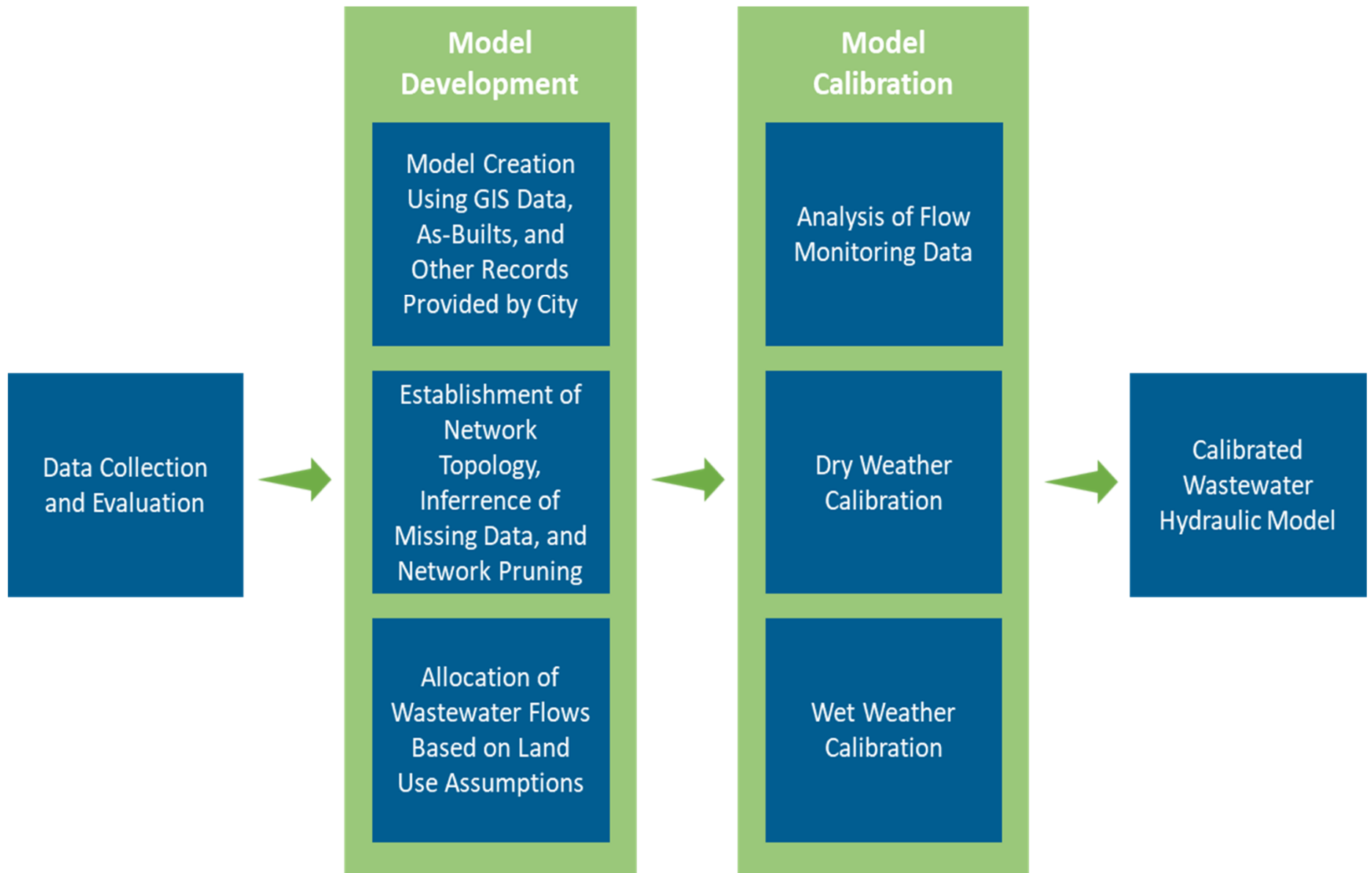
Proj. No.	Project Name	Cost
A	16-inch SH 45 Water Line Extension	\$854,395
1	2.5-MG North Elevated Storage Tank	\$9,170,700
2	6.0-MGD 800' PZ Pump Station	\$7,897,100
3	2.0-MG 800' PZ Elevated Storage Tank	\$7,993,500
4	30/24/20/16-inch Water Lines to Convert East PZ to 800' PZ	\$2,931,900
5	16/12-inch Water Lines in New 800' PZ	\$8,444,700
6	42/36-inch Weiss Lane/Pecan Street Water Lines	\$10,531,300
7	36/30-inch Weiss Lane/Kelly Lane Water Lines	\$9,377,400
8	Water Treatment Plant Expansion to 20.5 MGD	\$23,000,000
9	WTP, HSPS, and Lake PS Expansion to 30.0 MGD	\$38,810,200
10	20-inch State Highway 130 Water Line	\$2,196,700
11	30/24-inch State Highway 130 Water Lines	\$5,846,500
12	24/20-inch State Highway 45 Water Lines	\$2,453,900
13	16-inch Colorado Sand Drive Looping	\$1,001,500
14	16/12-inch Looping Improvements in Central PZ	\$7,012,700
15	24/16/12-inch Water Lines to Convert Manville 900' PZ to Central PZ	\$13,589,800
16	2.0-MG Rowe Elevated Storage Tank	\$7,286,500
17	12/8-inch Water Lines to Convert Manville 900' PZ to New 800' PZ	\$3,398,200
Total 2019 - 2024		\$161,796,995
Total 2025 - 2029		\$118,421,700
Total 2030 - Buildout		\$247,844,300
Rehabilitation Total		\$4,545,600

Note: Project costs include 18% for engineering/survey and 30% for contingency.

EXISTING WASTEWATER SYSTEM



WASTEWATER MODEL DEVELOPMENT



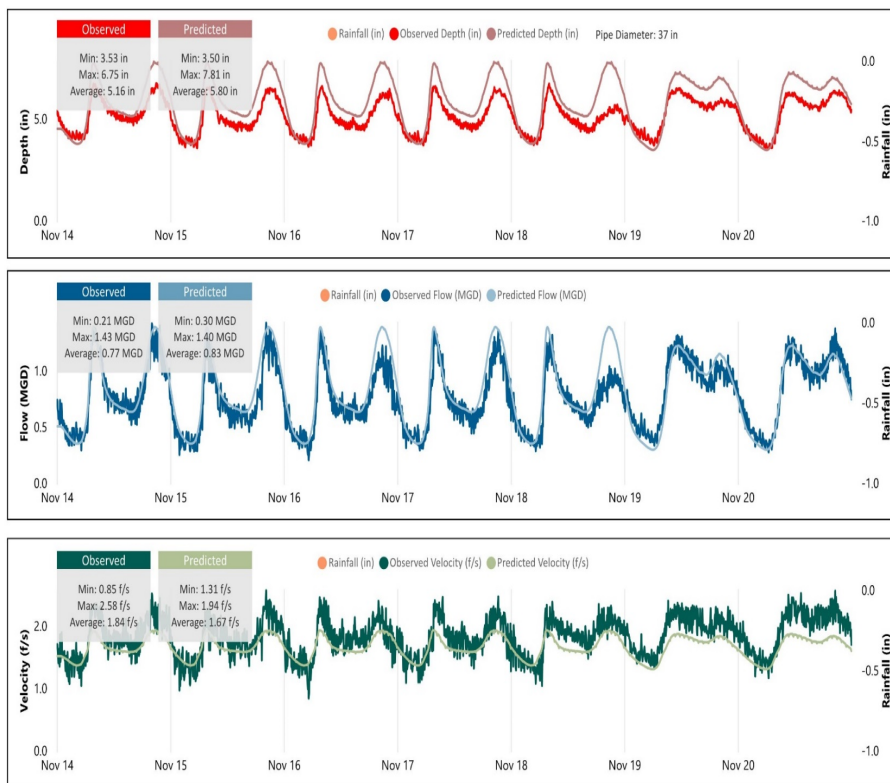
WASTEWATER MODEL CALIBRATION

Dry Weather Calibration November 14-20, 2016

DWF Calibration Results

FM_20
Flow Monitor

RG-04.02
Rain Gauge

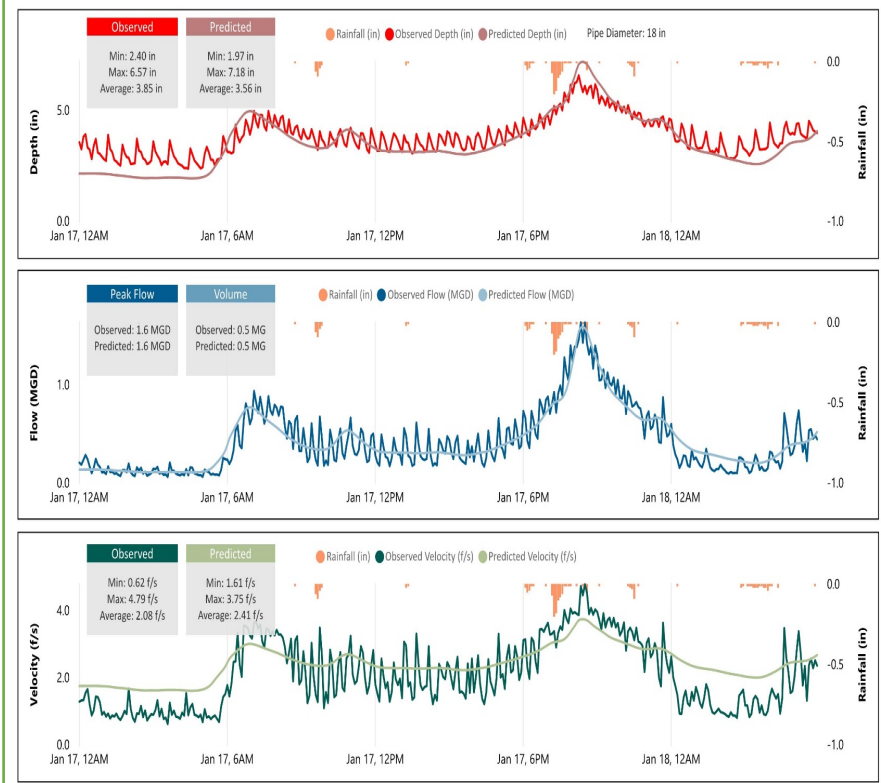


Wet Weather Calibration January 16-17, 2017

WWF Calibration Results

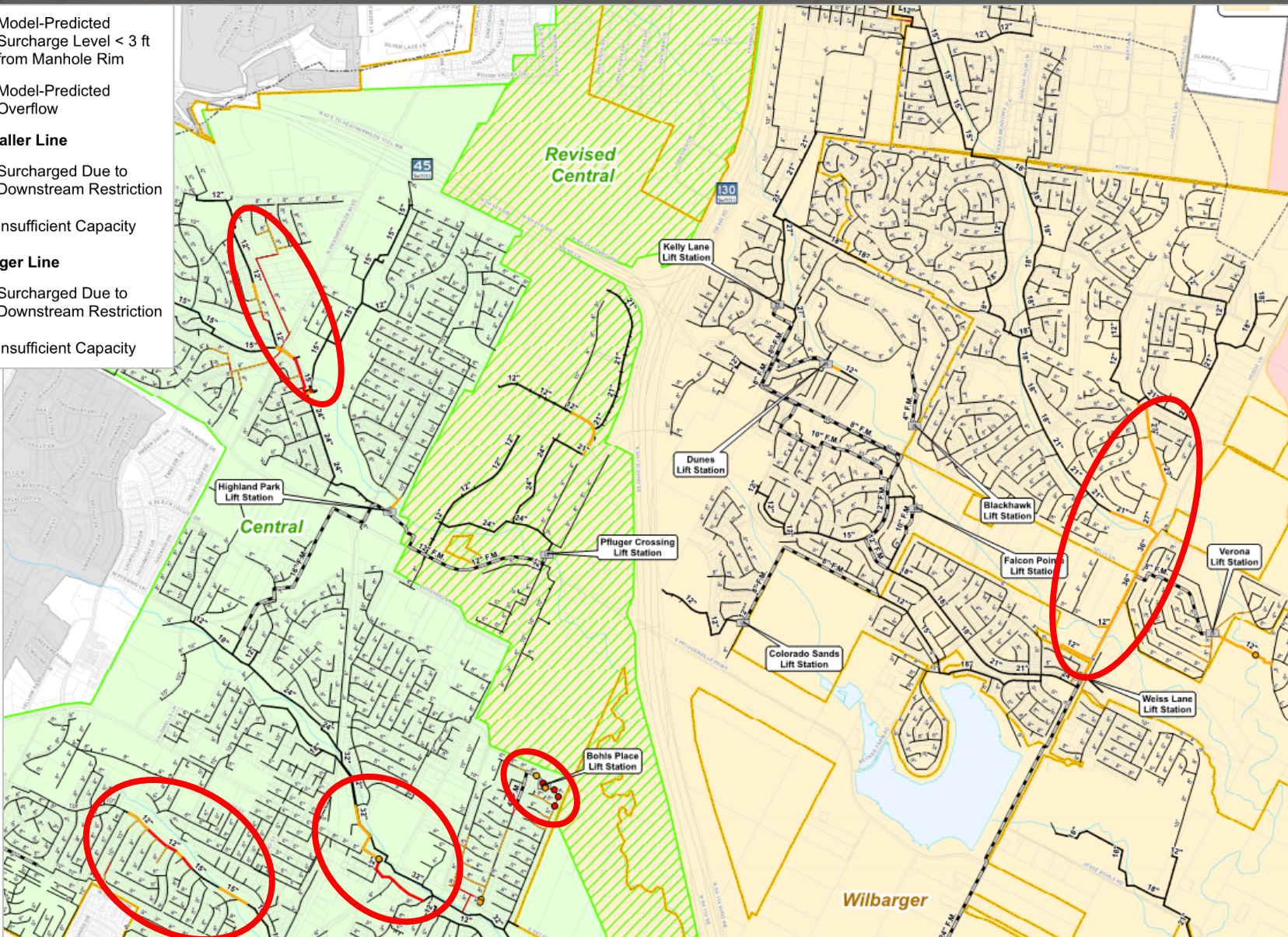
FM_22
Flow Monitor

RG-05.02
Rain Gauge

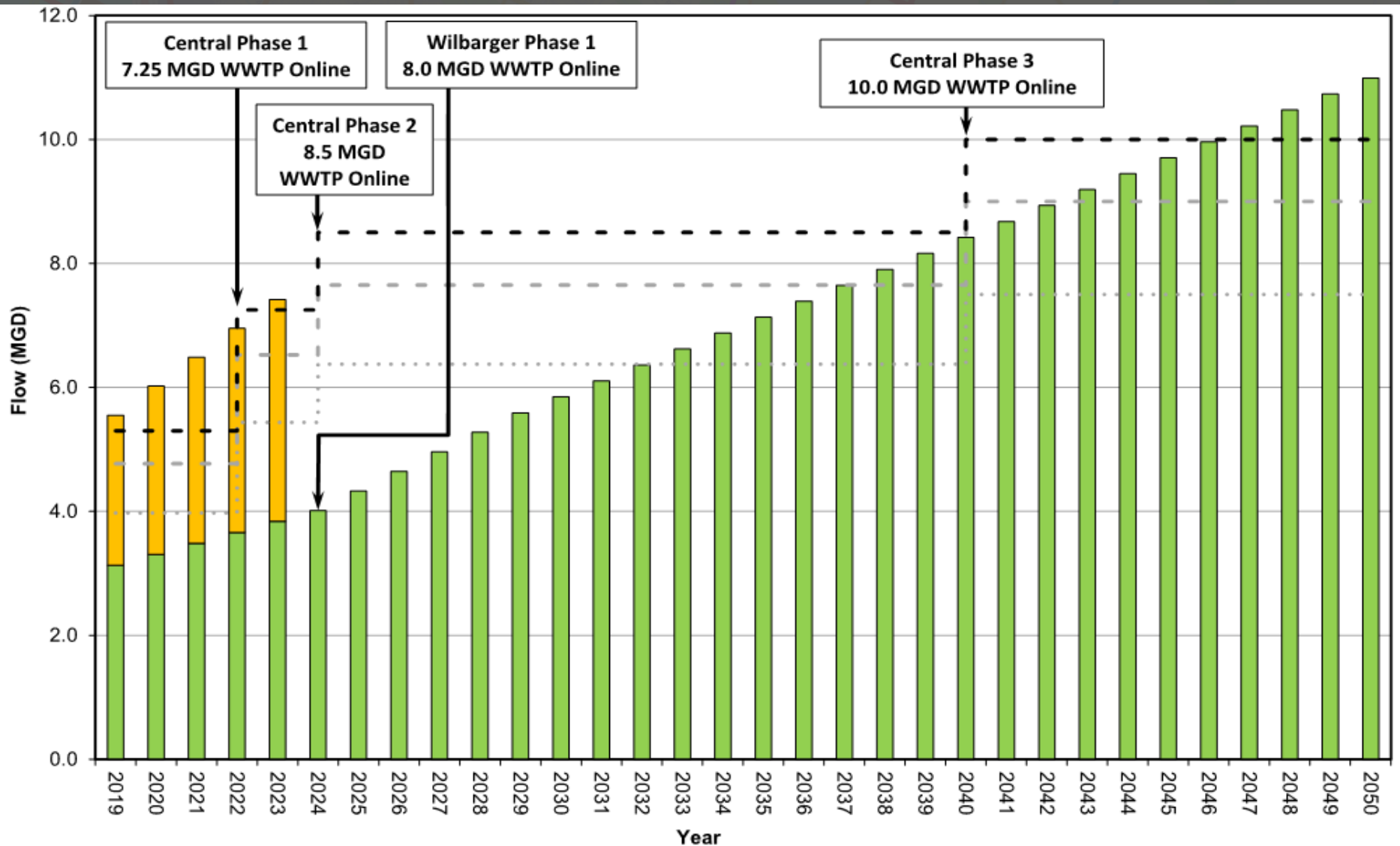


WASTEWATER SYSTEM ANALYSES

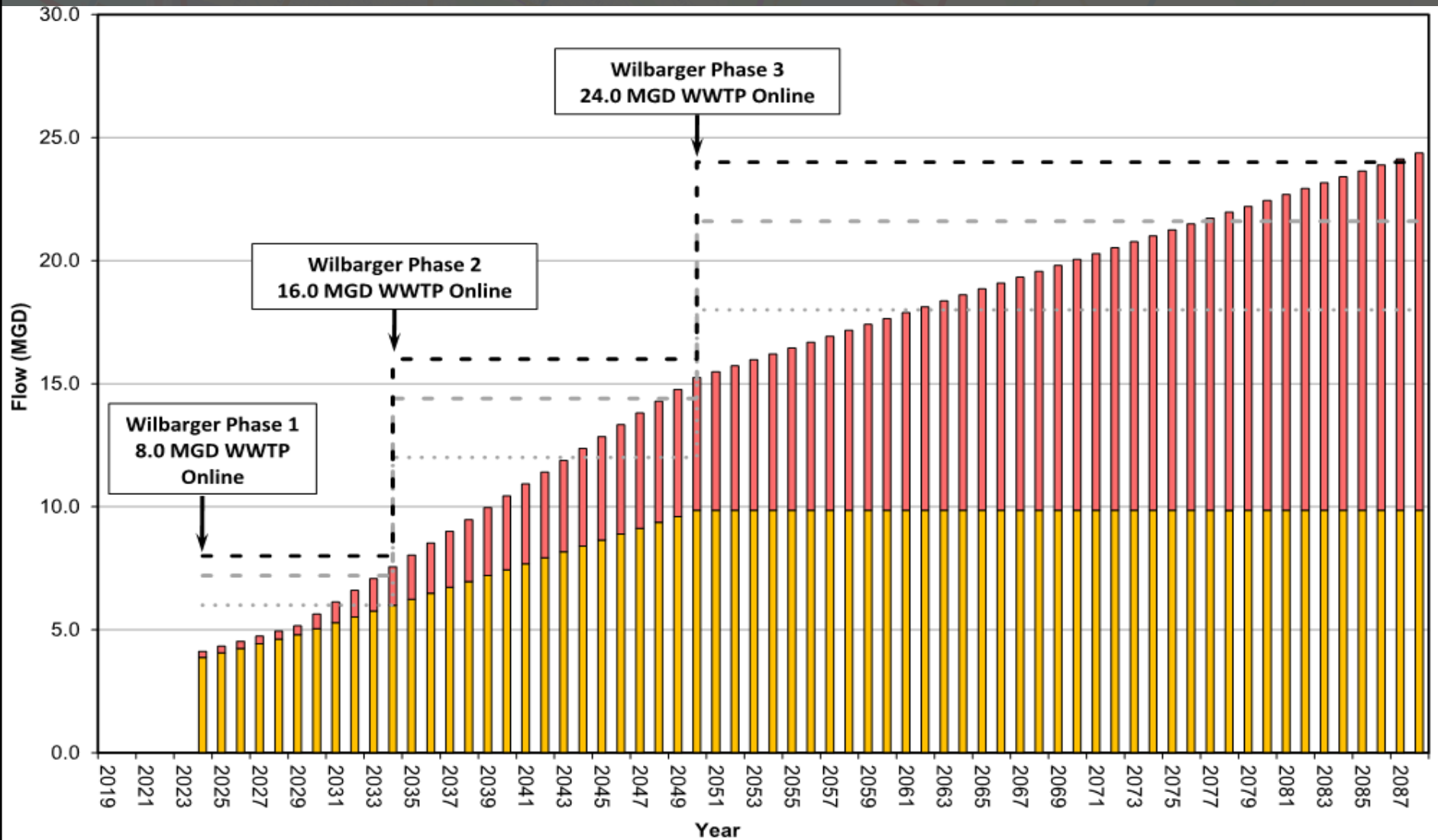
- Model-Predicted
Surcharge Level < 3 ft
from Manhole Rim
- Model-Predicted
Overflow
- 10" and Smaller Line**
 - Surcharged Due to
Downstream Restriction
 - Insufficient Capacity
- 12" and Larger Line**
 - Surcharged Due to
Downstream Restriction
 - Insufficient Capacity




WASTEWATER TREATMENT PLANT



WASTEWATER TREATMENT PLANT



WASTEWATER SYSTEM ASSET MANAGEMENT

- 
- Blackhawk
 - Bohls Place
 - Boulder Ridge
 - Club
 - Colorado Sands
 - Dunes
 - Falcon Pointe
 - Kelly Lane
 - Pfluger Crossing
 - Renewable Energy
 - Verona

WASTEWATER SYSTEM ASSET MANAGEMENT

CONDITION ASSESSMENT				
Component Group	Component Condition Rating	Weight Factor	Weighted Component Rating	Comments
Pumps and Motors	1	20%	0.20	
Major Electrical Equipment - Service Disconnect, Motor Starters, etc.	1	10%	0.10	
Back-up Power or Dual Power Feed - Transfer Switch, Connection for Portable Generator, Generator, etc.	5	7%	0.35	Recommend addition of generator connection to meet TCEQ
Misc. Electrical - Cable, Conduit, Grounding, Panels, Lighting, etc.	1	3%	0.03	
Instrumentation - SCADA, alarms	2	15%	0.30	Recommend connecting the site to SCADA
Structure - Hatches, Corrosion, Cracks, Leaking, Ventilation, Odor Control	3	20%	0.60	Valve vault not draining in wet well
Piping and Valves	4	15%	0.60	Coat vault piping, address corrosion on pump rails, and drain flap valve in wet well
Site - Drainage, Access Drive, Security, Fencing	3	10%	0.30	Seal coat asphalt
Total Inspection Score	-	100%	2.48	
Condition Rating	-	-	2.48	Fair

CRITICALITY ASSESSMENT			
Component Group	Component Criticality Rating	Weight Factor	Weighted Component Rating
Environmentally Sensitive Areas	1	25%	0.25
Population Served	4	50%	2.00
High Impact Areas	5	25%	1.25
Criticality Rating	-	100%	3.50

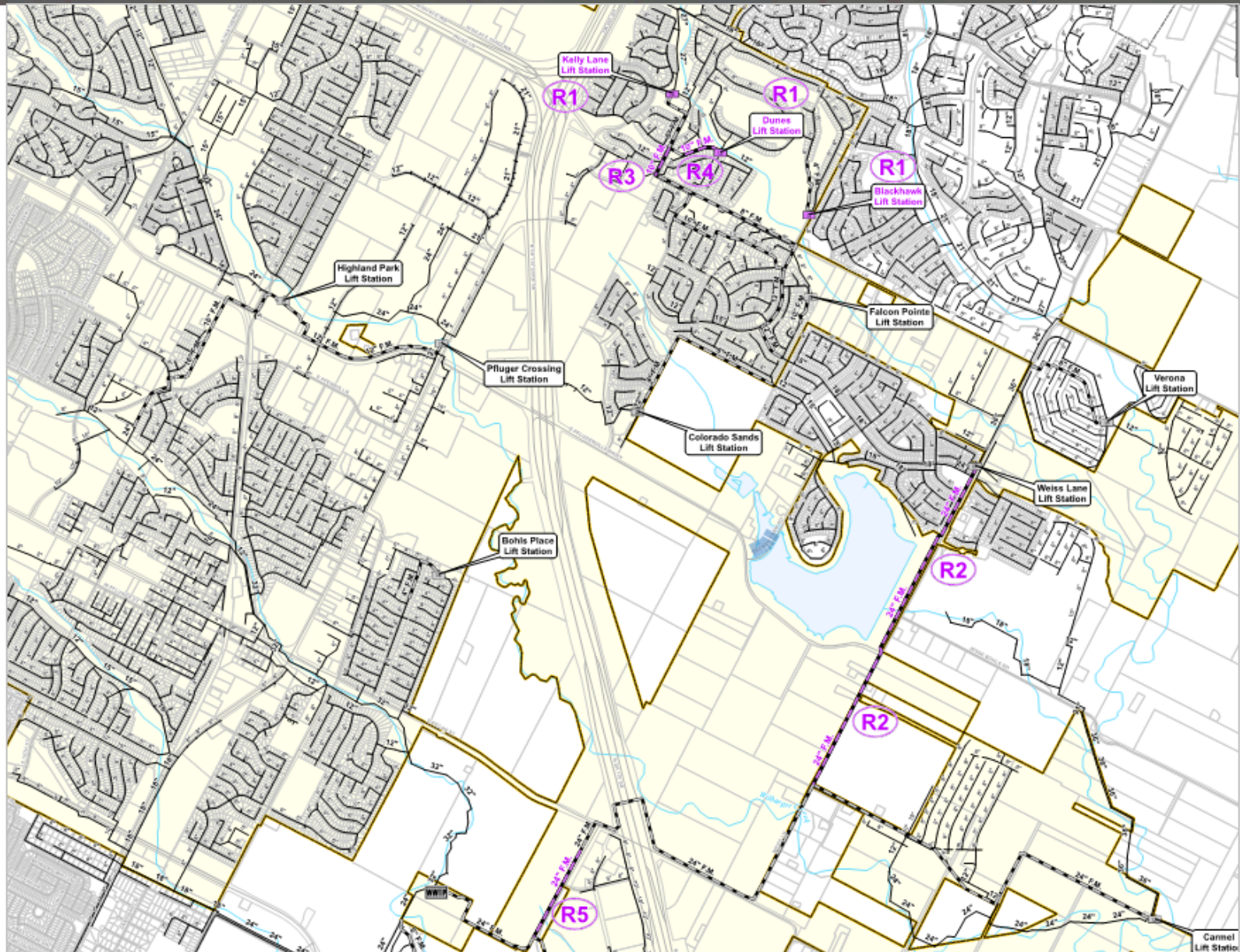
WASTEWATER SYSTEM ASSET MANAGEMENT

Risk Rating = Condition + Criticality		Condition Ranking				
		Very Good	Good	Fair	Poor	Very Poor
Criticality Ranking	Very Low Impact					
	Low Impact					
	Moderate Impact					
	High Impact		Colorado Sands Lift Station Falcon Pointe Lift Station Renewable Energy Lift Station Verona Lift Station	Blackhawk Lift Station Bohls Place Lift Station Boulder Ridge Lift Station Club Lift Station		
	Very High Impact		Kelly Lane Lift Station Pfluger Crossing Lift Station		Dunes Lift Station	

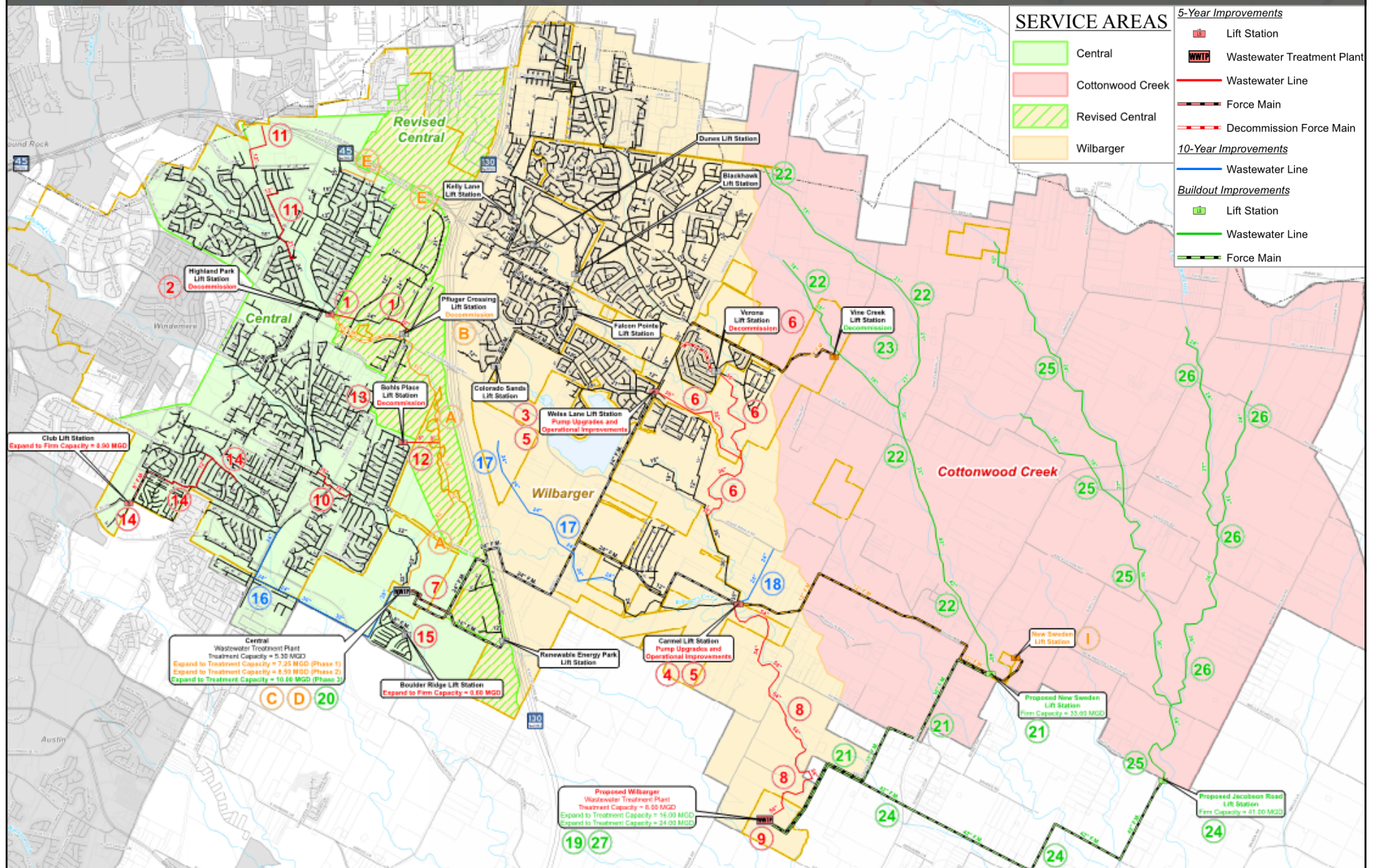
WASTEWATER SYSTEM ASSET MANAGEMENT

Risk Rating = Condition + Criticality		Condition Ranking				
		Very Good	Good	Fair	Poor	Very Poor
Criticality Ranking	Very Low Impact	871,246 LF	3,421 LF	0 LF	2,546 LF	0 LF
	Low Impact	225,035 LF	3,178 LF	0 LF	343 LF	0 LF
	Moderate Impact	61,092 LF	1,419 LF	0 LF	0 LF	0 LF
	High Impact	23,264 LF	2,403 LF	0 LF	0 LF	0 LF
	Very High Impact	160 LF	0 LF	0 LF	0 LF	0 LF

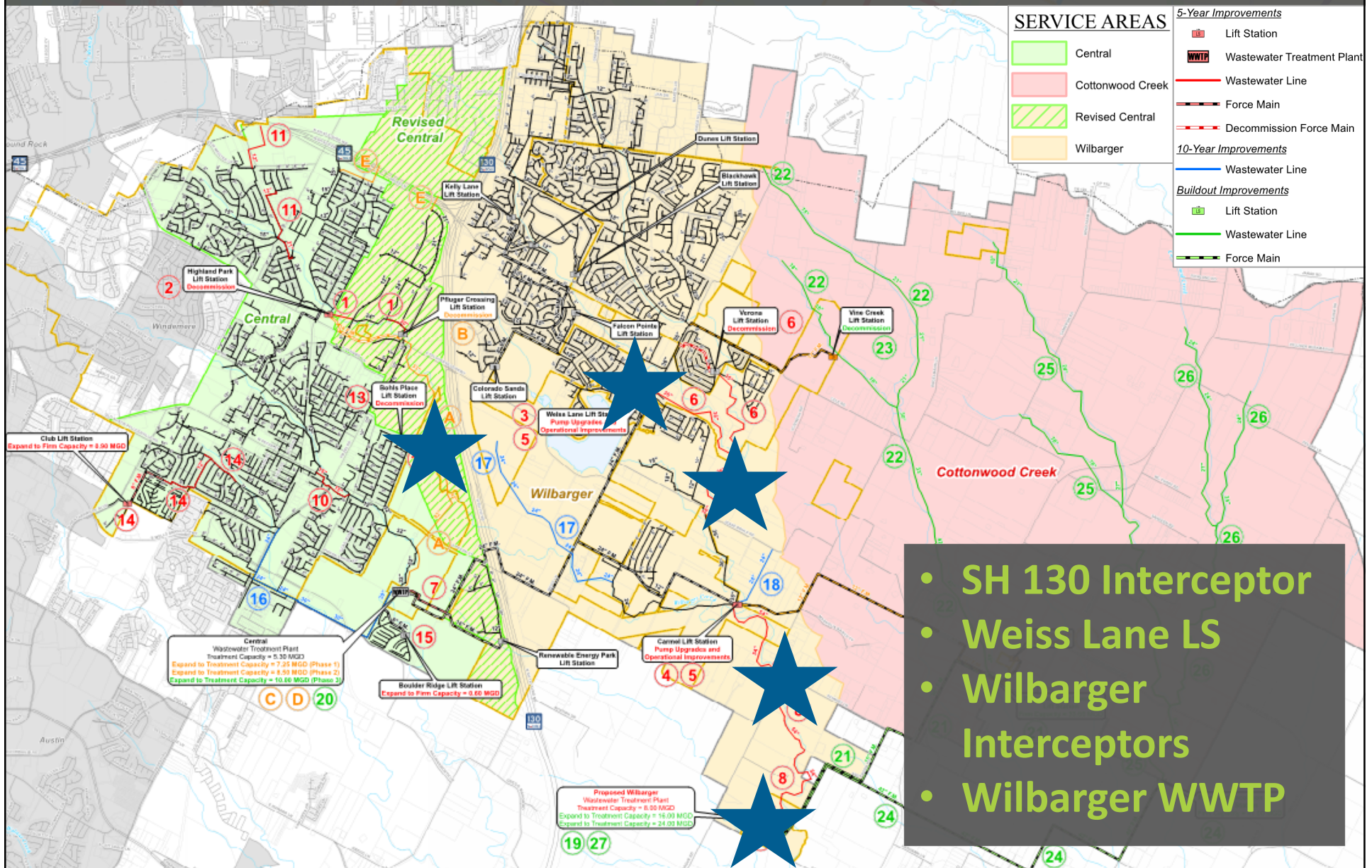
WASTEWATER REHABILITATION CIP



WASTEWATER CIP

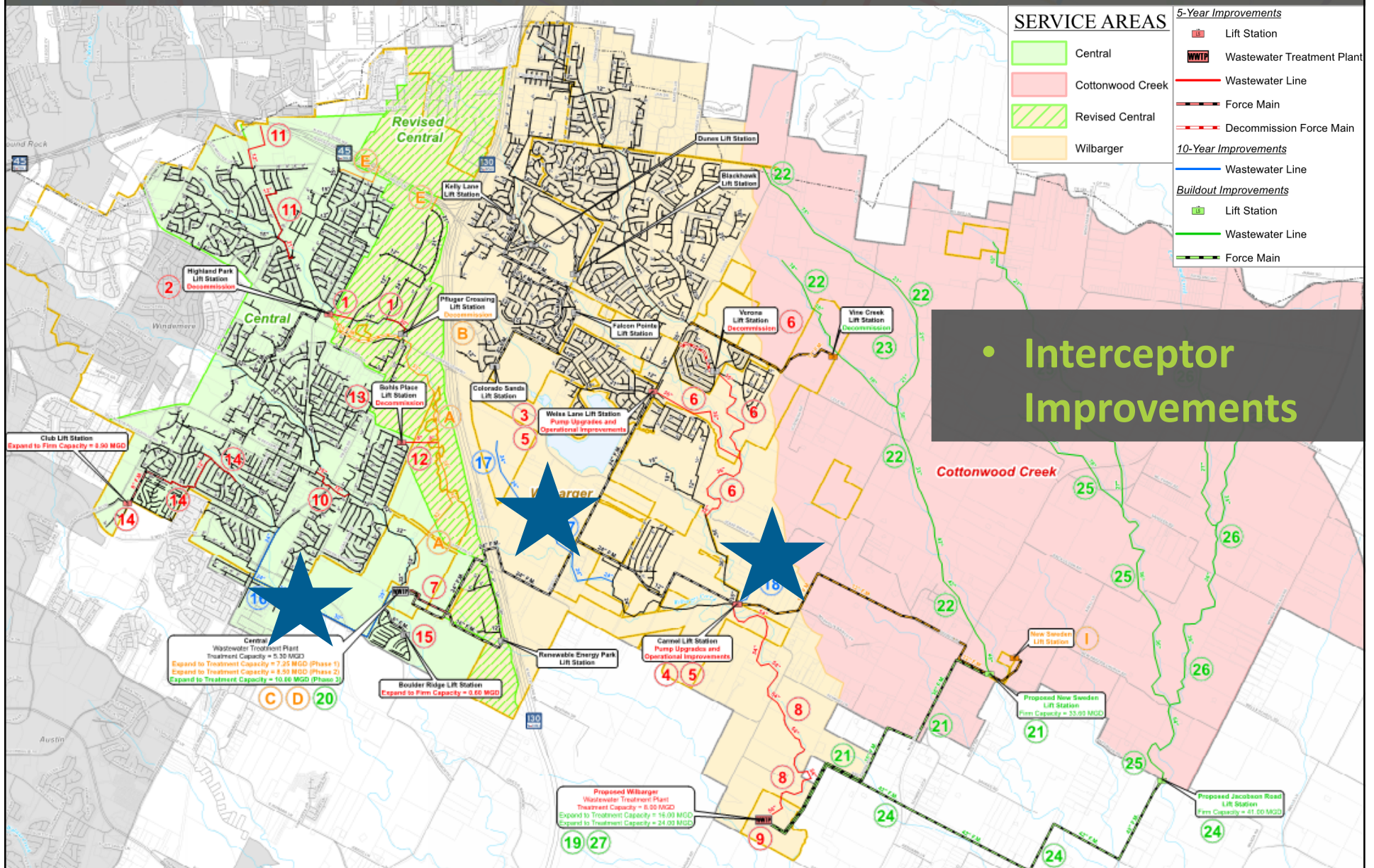


WASTEWATER CIP – 5-YEAR HIGHLIGHTS



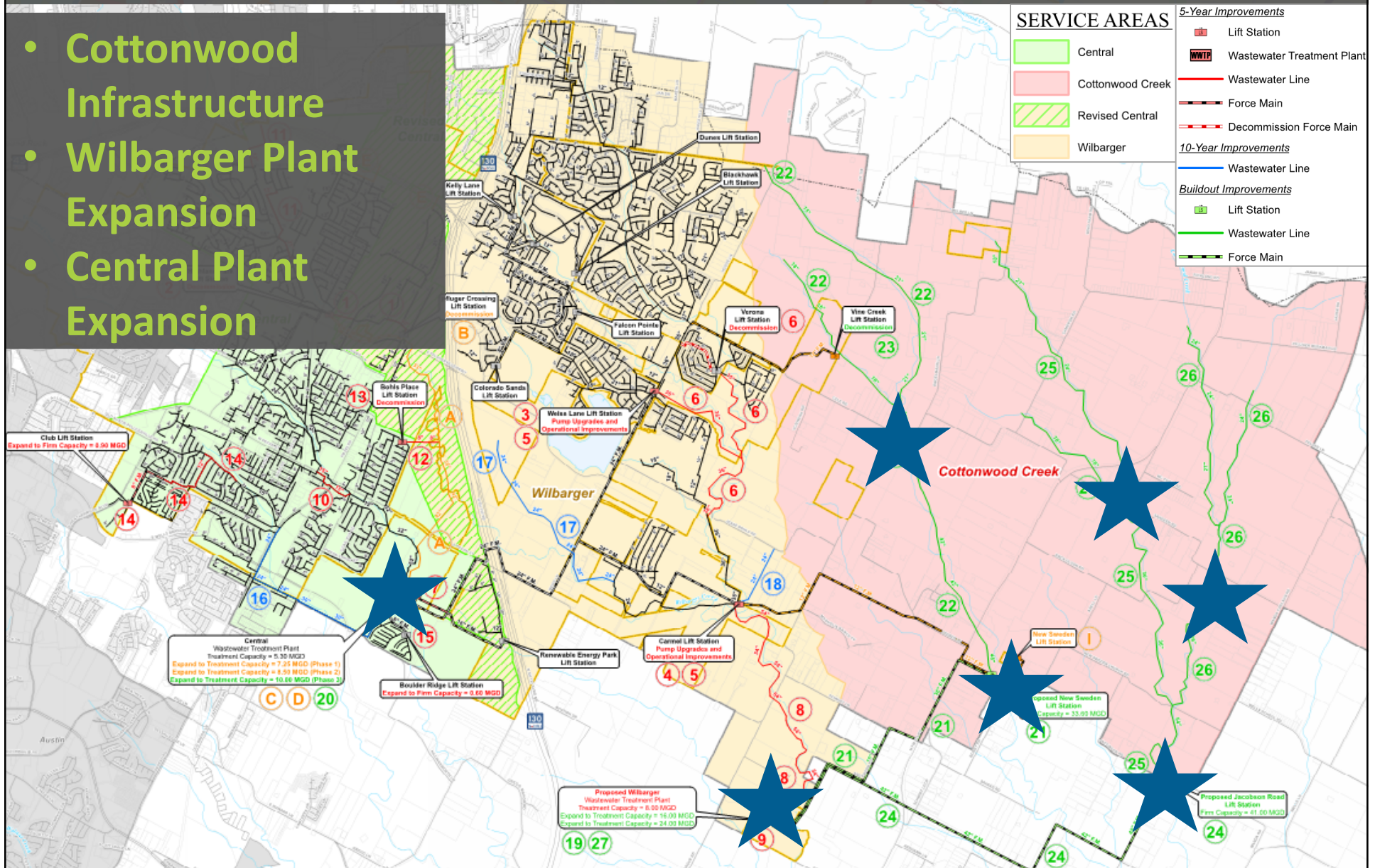
- SH 130 Interceptor
- Weiss Lane LS
- Wilbarger Interceptors
- Wilbarger WWTP

WASTEWATER CIP – 10-YEAR HIGHLIGHTS



WASTEWATER CIP – BUILDOUT HIGHLIGHTS

- Cottonwood Infrastructure
- Wilbarger Plant Expansion
- Central Plant Expansion



WASTEWATER CIP COST

Project No.	Project Name	Cost
A	42/36/33-inch SH 130 Interceptor	\$16,000,000
B	Decommission Pfluger Crossing Lift Station	\$306,800
C	Central Wastewater Treatment Plant Phase 1 Expansion	\$44,000,000
D	Central Wastewater Treatment Plant Phase 2 Expansion	\$18,560,000
E	24/15-inch SH 45 Interceptors	\$2,229,300
Total Under Design		\$81,096,100
1	30/24-inch Highland Park Interceptor	\$1,794,800
2	Decommission Highland Park Lift Station	\$306,800
3	Weiss Lane Lift Station Pump Upgrades	\$400,000
4	Carmel Lift Station Pump Upgrades	\$350,000
5	Weiss Lane LS and Carmel LS Operational Improvements	\$1,840,000
6	Sorento Interceptor Phase 2	\$4,892,000
7	Renewable Energy Park Force Main Extension	\$506,000
8	54-inch Wilbarger Creek Interceptor	\$25,007,300
9	8.0 MGD Wilbarger Wastewater Treatment Plant	\$115,440,000
10	15-inch Gilleland Creek Interceptor	\$1,036,300
11	21/12-inch North Central Basin Interceptors	\$2,839,500
12	8-inch Bohls Place Interceptor	\$652,000
13	Decommission Bohls Place Lift Station	\$306,800
14	Club Lift Station Expansion	\$4,059,000
15	Boulder Ridge Lift Station Expansion	\$552,300
Total 2019-2024		\$159,982,800
Total 2025-2029		\$20,750,500
Total 2030-Buildout		\$311,988,500
Rehabilitation Total		\$4,095,200

Note: Project costs include 18% for engineering/survey and 30% for contingency.



QUESTIONS AND ANSWERS

Jessica Vassar, P.E.
JBV@freeze.com
512-617-3167

WATER/WASTEWATER MASTER PLANS

