WATER SYSTEM ANALYSIS

2023 Water Master Plan for Travis County W.C.&I.D. Point Venture

June 2023

WHY WAS THIS PROJECT NEEDED?

- Low water pressure issues
- Configuration of the Lower and Upper Pressure Planes
- Pumping capacity deficiencies for the Augusta Pump Station
- Operational deficiencies for the Augusta Standpipe
- Last system study and water model update was developed nearly 10 years ago

PROJECT SCOPE

- Develop a water system map
- Evaluate pumping, storage, and distribution capacities to TCEQ requirements
- Determine existing and future (full build-out) water usage and demands
- Develop water model for existing and future conditions
- Identify deficiencies from system evaluations and water model
- Provide and prioritize recommendations for improvement projects

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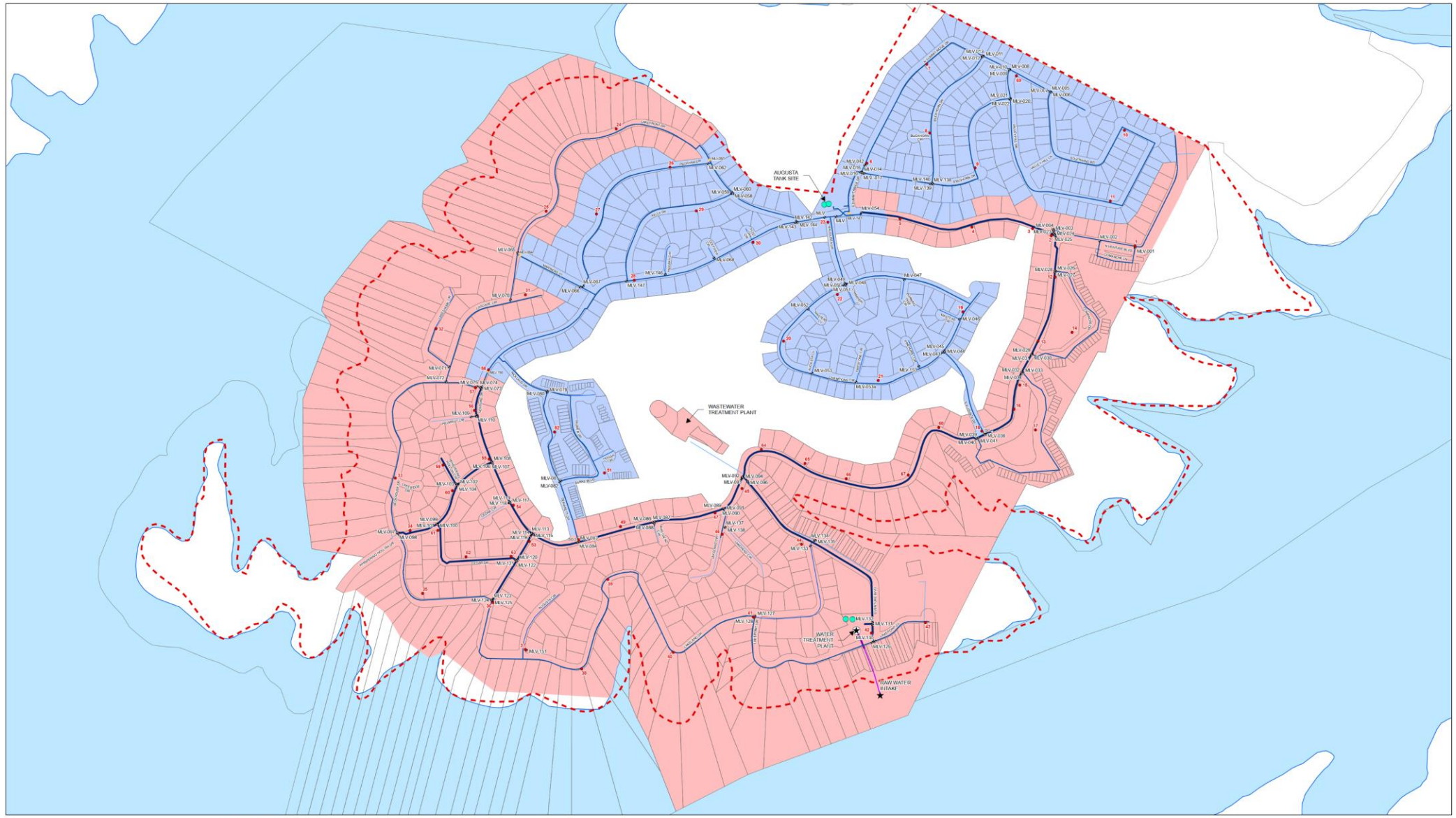

EXPLANATION

- WATER TREATMENT PLANT
- RAW WATER INTAKE
- WATER TANK
- FIRE HYDRANT
- GATE VALVE
- PRESSURE PLANE ISOLATION GATE VALVE

WATER LINES
- MAIN PIPELINE - 8"
- MAIN PIPELINE - 6"
- MAIN PIPELINE - 4"
- MAIN PIPELINE - 2"

RAW WATER LINES
- RAW WATER LINE - 8"
- RAW WATER LINE - 6"

- CCN
- TRAVIS COUNTY LAND PARCEL - SITE
- UPPER PRESSURE PLANE
- LOWER PRESSURE PLANE

ABBREVIATIONS

CCN - CERTIFICATE OF CONVENIENCE AND NECESSITY.
ISO - ISOLATION
MLV - MAIN LINE VALVE

N

0 330 660'

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EXHIBIT D

EXISTING WATER SYSTEM MAP

WATER SYSTEM ANALYSIS
TRAVIS COUNTY W.C.&I.D. POINT VENTURE
POINT VENTURE, TEXAS

Drawn By: DH	Checked By: KP	Scale: 1 " = 330 '	Date: 6/1/23	File: ModelExhibitD.mxd

EXIST. WATER SYSTEM FACILITIES

Facility	Supply Source	Capacity (gal)	Supply/Service Pumps		Service Area
			Individual (gpm)	Firm Capacity (gpm)	
Raw Water Barge Intake Pump Station	Lake Travis	-	350 350 350	700	-
WTP	Raw Water Barge Intake Pump Station	0.95 MGD	-	-	-
Plant A Transfer Pump Station	Plant A	-	350 350	350	-
Plant B Transfer Pump Station	Plant B	-	350 350	350	-
Clearwell #1	Plant A / B Transfer Pump Stations	96,687	-	-	System
Clearwell #2	Plant A / B Transfer Pump Stations	119,590	-	-	System
WTP High Service Pump Station	Clearwells #1 and #2	-	660 660	660	System
Augusta Standpipe	WTP High Service Pump Station	296,089	-	-	Lower Pressure Plane
Augusta Pump Station	Augusta Standpipe	-	469 469	469	Upper Pressure Plane
Augusta EST	Augusta Pump Station	50,000	-	-	Upper Pressure Plane

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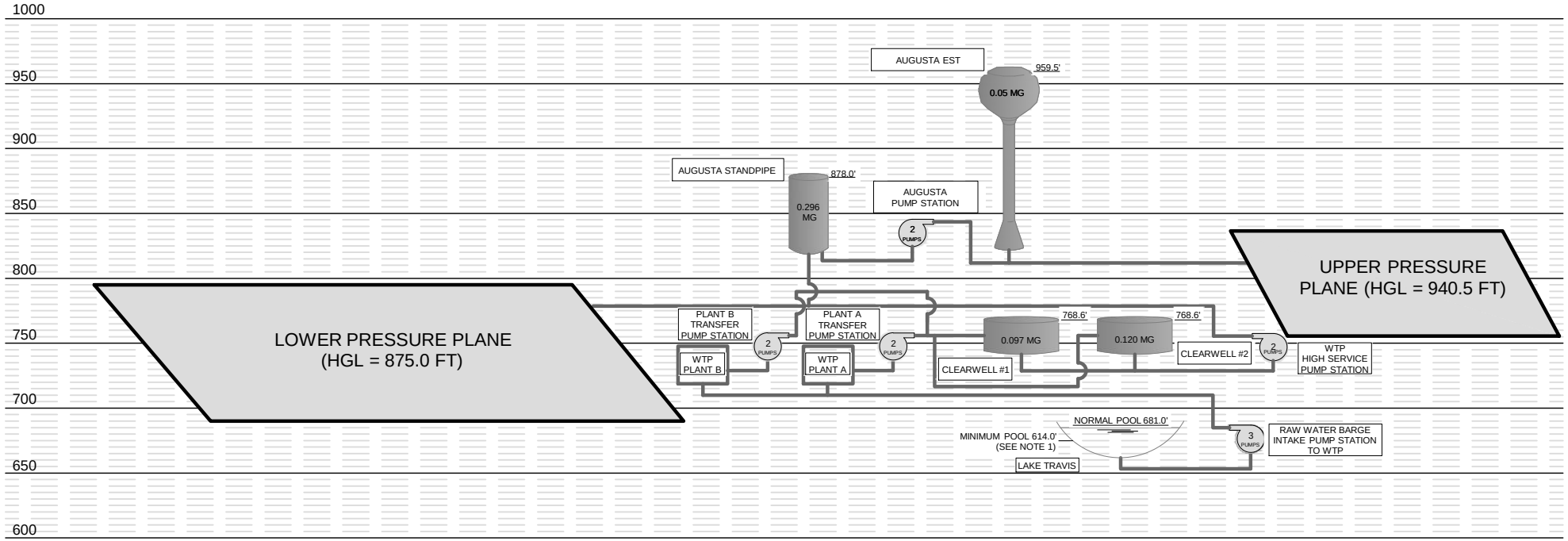

FACILITY NAME	INSIDE DIAMETER (FT)	FINISH FLOOR ELEVATION (MSL)	OVERFLOW ELEVATION (MSL)	HEIGHT (FT)	CAPACITY (GAL)	FUNCTION
CLEARWELL #1	26.75	745.60	768.60	23.00	96,687	CLEARWELL STORAGE FEEDING HIGH SERVICE PUMPS
CLEARWELL #2	29.75	745.60	768.60	23.00	119,590	CLEARWELL STORAGE FEEDING HIGH SERVICE PUMPS
AUGUSTA STANDPIPE	30.00	822.00	878.00	56.00	296,089	GROUND AND ELEVATED STORAGE FOR LOWER PRESSURE PLANE
AUGUSTA EST	24.00	824.50	959.50	135.00	50,000	ELEVATED STORAGE FOR UPPER PRESSURE PLANE

ABBREVIATIONS

EST	ELEVATED STORAGE TANK
FT	FEET
GAL	GALLON
HGL	HYDRAULIC GRADE LINE (FT)
MG	MILLION GALLON
MSL	MEAN SEA LEVEL (FT)
WTP	WATER TREATMENT PLANT

NOTES:

1. THE 614.0' MINIMUM POOL IS THE ELEVATION TO MEET FIRM PUMP CAPACITY OF THE RAW WATER BARGE INTAKE PUMP STATION.

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EXHIBIT B

EXISTING PRESSURE PLANE SCHEMATIC

WATER SYSTEM ANALYSIS
TRAVIS COUNTY W.C.& I.D. POINT VENTURE
POINT VENTURE, TX

Drawn By: KP	Checked By: DV	Scale: N.T.S.	Date: 6/2/2023

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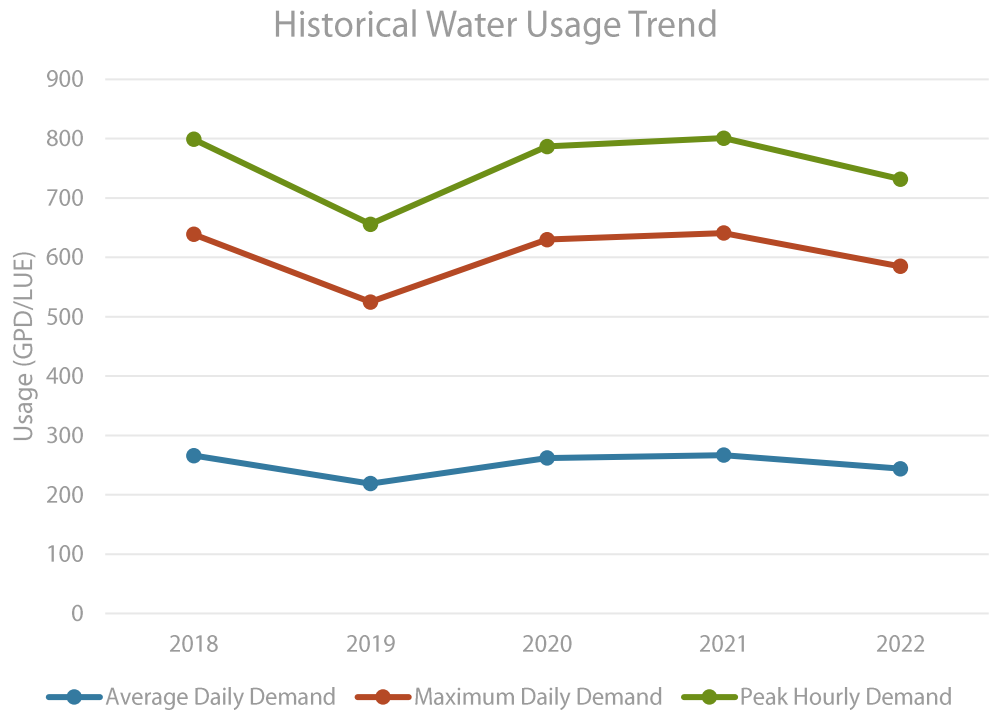
DESIGN CRITERIA

- Historical Data Criteria
  - Collected data from 5 years of water usage
  - Maximum Daily Demand = 2.4 X Average Daily Demand
  - Peak Hourly Demand = 1.25 X Maximum Daily Demand

Average Daily Demand: 267 gpd/LUE
Maximum Daily Demand: 933 gpd/LUE
Peak Hourly Demand: 1,701 gpd/LUE (Adjusted for High Demand Hour)



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DESIGN CRITERIA

- TCEQ Requirements (Chapter 290, Section 45)
  - 0.46 gpm/LUE (per TCEQ alternative production capacity) for raw water pumps (firm), treatment plant (normal rated design flow), and transfer pumps (firm)
  - 200 gal/LUE for ground storage
  - 100 gal/LUE for elevated storage
  - Clearwell capacity is 5% of daily treatment plant capacity
  - Service pump capacity is 2.0 gpm/LUE or if the system provides elevated storage of 200 gal/LUE, min. (2) service pumps with combined capacity of 0.6 gpm/LUE

Trihydro

EXISTING SYSTEM EVALUATION

Facility	Minimum Requirements	Existing Capacity
WTP		
Raw Water Pump Capacity	0.46 gpm/LUE	700 gpm
		1,522 LUEs
Treatment Plant Capacity	0.46 gpm/LUE	660 gpm
		1,435 LUEs
Transfer Pump Capacity		
Plant A Transfer Pump Station	0.46 gpm/LUE	350 gpm
		761 LUEs
Plant B Transfer Pump Station	0.46 gpm/LUE	350 gpm
		761 LUEs
Subtotal		*700 gpm*
		1,522 LUEs
Clearwell Storage Capacity		
Clearwells #1 & #2	5% daily plant capacity	216,277 gal
		22.76%
Service Pump Capacity		
WTP High Service Pump Station	2.00 gpm/LUE	1,320 gpm
		660 LUEs
Lower Pressure Plane		
Ground Storage Capacity		
Augusta Standpipe	200 gal/LUE	280,227 gal
		1,401 LUEs
Elevated Storage Capacity		
Augusta Standpipe	100 gal/LUE	15,862 gal
		159 LUEs
Upper Pressure Plane		
Elevated Storage Capacity		
Augusta EST	100 gal/LUE	50,000 gal
		500 LUEs
Service Pump Capacity		
Augusta Pump Station	2.00 gpm/LUE	469 gpm
		235 LUEs

- Existing Number of LUEs Total: 1,000
  - Upper Pressure Plane: 400
  - Lower Pressure Plane: 600

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WATER MODEL OVERVIEW

- Water model updates are necessary to ensure that all infrastructure still meets TCEQ requirements and adequate pressures are maintained in the system
- Used WaterGEMS software to model the existing and future conditions in the system
- Calibrated model using feasible hydrant field test data
- Developed model using GIS information and as-built plan sets

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EXISTING CONDITIONS

LOW SYSTEM PRESSURES

- Low pressures in the model occurred at areas with high elevations
  - Occurred on the southwest portion of Venture Blvd. near where there is a transition from the Upper and Lower Pressure Planes

HIGH SYSTEM PRESSURES

- High pressures in the model occurred in areas with low elevations in the Upper Pressure Plane

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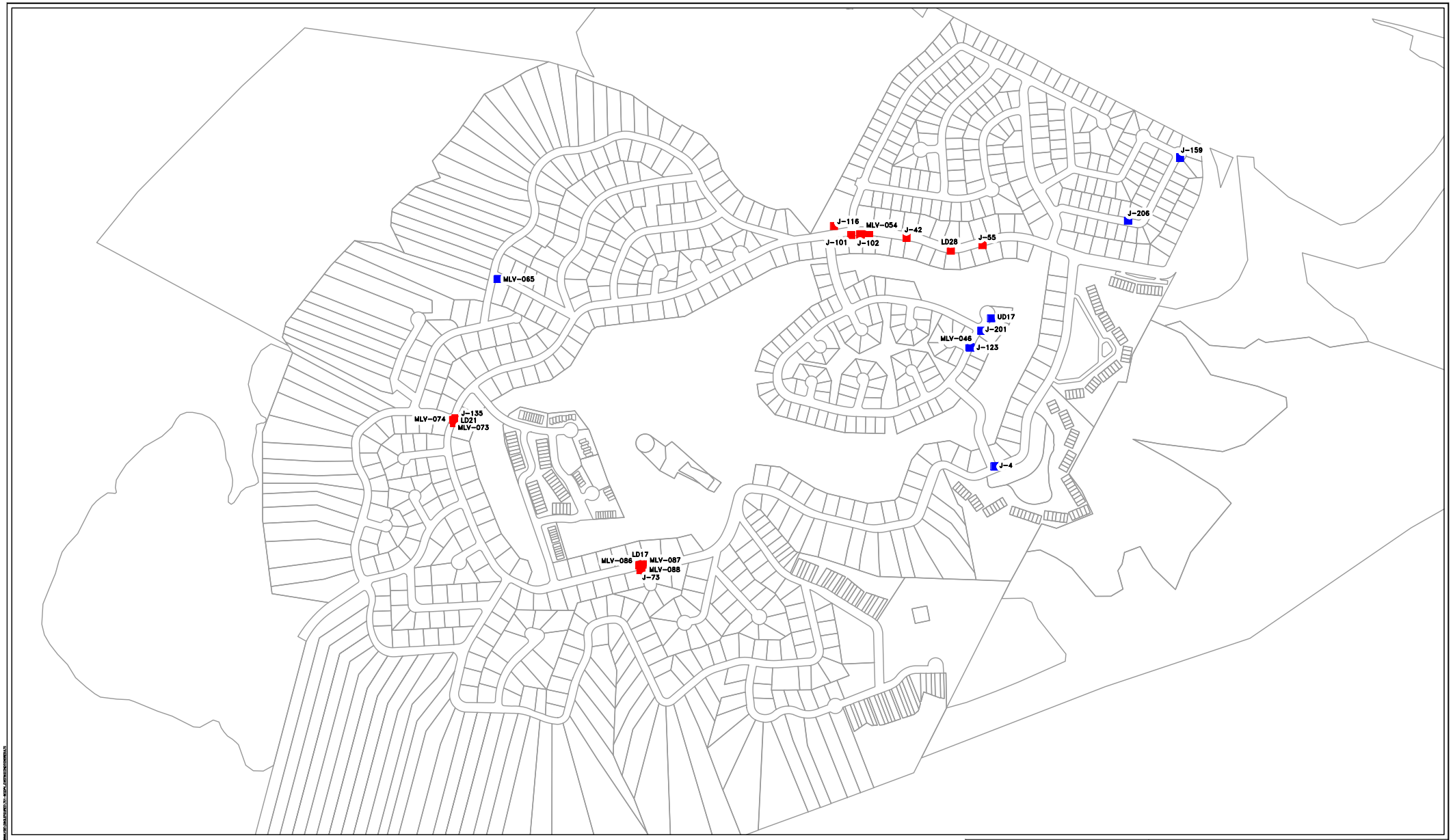

EXPLANATION

- PRESSURE < 35 PSI
- PRESSURE > 85 PSI

ABBREVIATIONS:

J - JUNCTION NODE
LD - LOWER PRESSURE PLANE DEMAND NODE
MLV - MAIN LINE VALVE
UD - UPPER PRESSURE PLANE DEMAND NODE

N

0 300' 600'

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EXHIBIT G-1

EXISTING CONDITIONS AVERAGE DAY WATER MODEL RESULTS MAP

WATER SYSTEM ANALYSIS
TRAVIS COUNTY W.C.& I.D. POINT VENTURE
POINT VENTURE, TX

Drawn By: KP	Checked By: DV	Scale: 1" = 300'	Date: 5/26/2023

EXISTING CONDITIONS

FIRE FLOW

- Fire flows less than 1,000 gpm and less than 20 psi exist in the model
- Caused in areas that are furthest from the water supply for the Upper and Lower Pressure Planes (furthest from the Transfer Service Pump Station at the WTP in the Lower Pressure Plane and furthest from the High Service Pump Station in the Upper Pressure Plane)

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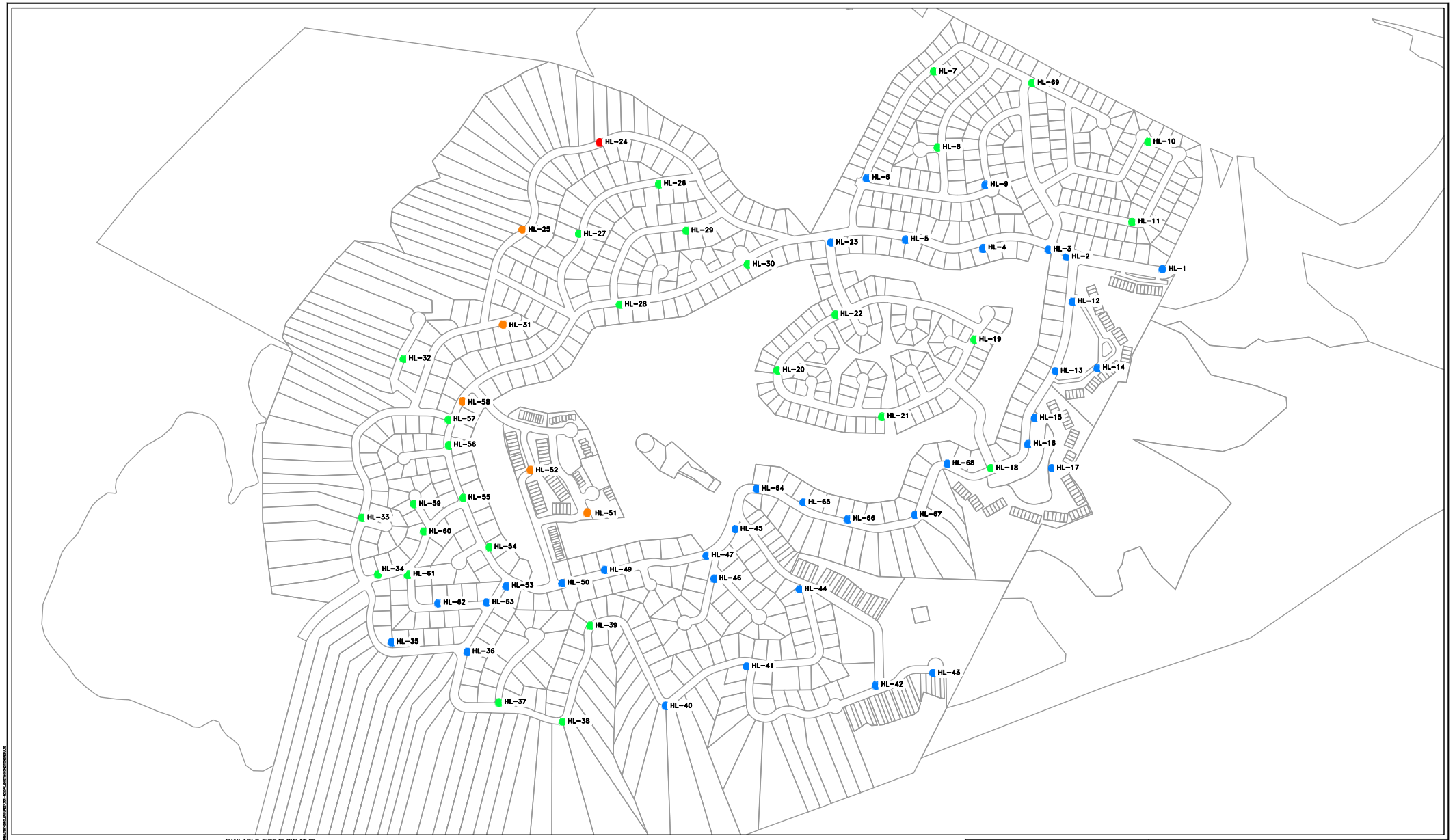

NFPA COLOR	NFPA CLASS	AVAILABLE FIRE FLOW AT 20 PSI RESIDUAL PRESSURE	DESCRIPTION
LIGHT BLUE	AA	1,500 GPM AND ABOVE	VERY GOOD FLOWS
GREEN	A	1,000 - 1,499 GPM	GOOD FOR RESIDENTIAL AREAS
ORANGE	B	500 - 999 GPM	MARGINALLY INADEQUATE
RED	C	LESS THAN 500 GPM	INADEQUATE

HYDRANT CLASSIFICATION AND COLOR CODING PER NFPA 291, RECOMMENDED PRACTICE FOR FIRE FLOW TESTING AND MARKING OF HYDRANTS.

MINIMUM REQUIRED AVAILABLE FIRE FLOW FOR THE WATER DISTRIBUTION SYSTEM IS 1,000 GPM.

ABBREVIATIONS:

GPM - GALLONS PER MINUTE
HL - HYDRANT NODE
NFPA - NATIONAL FIRE PROTECTION ASSOCIATION
PSI - POUNDS PER SQUARE INCH

N

0 300' 600'

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EXHIBIT G-4

EXISTING CONDITIONS FIRE FLOW WATER MODEL RESULTS MAP

WATER SYSTEM ANALYSIS

TRAVIS COUNTY W.C.& I.D. POINT VENTURE
POINT VENTURE, TX

Drawn By: KP	Checked By: DV	Scale: 1" = 300'	Date: 5/26/2023

ANTICIPATED DEMAND ALLOCATION

- Anticipated growth rate of 29 LUEs per year (~ 3% per year)
- Full Build-Out of approximately 1,190 LUEs occurring in 2029
- The additional LUEs were added onto demand nodes in the model based on where known developments are going to happen; any additional LUEs were divided between all demand node locations

FUTURE SYSTEM EVALUATION

Facility	Minimum Requirements	Future Capacity
WTP		
Raw Water Pump Capacity	0.46 gpm/LUE	700 gpm
		1,522 LUEs
Treatment Plant Capacity	0.46 gpm/LUE	660 gpm
		1,435 LUEs
Transfer Pump Capacity		
Plant A Transfer Pump Station	0.46 gpm/LUE	350 gpm
		761 LUEs
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Subtotal		*700 gpm*
		1,522 LUEs
Clearwell Storage Capacity		
Clearwells #1 & #2	5% daily plant capacity	216,277 gal
		22.67%
Combined Service Pump Capacity		
WTP High Service Pump Station	0.60 gpm/LUE	1,320 gpm
		1.11 gpm/LUE
Lower Pressure Plane		
Ground Storage Capacity		
Augusta Standpipe	200 gal/LUE	407,122 gal
		2,036 LUEs
Elevated Storage Capacity		
Augusta Standpipe	200 gal/LUE	138,000 gal
		690 LUEs
Upper Pressure Plane		
Elevated Storage Capacity		
Augusta EST	100 gal/LUE	50,000 gal
		500 LUEs
Service Pump Capacity		
Augusta Pump Station	2.00 gpm/LUE	1,000 gpm
		500 LUEs

- Future Number of LUEs Total: 1,190
  - Upper Pressure Plane: 500
  - Lower Pressure Plane: 690

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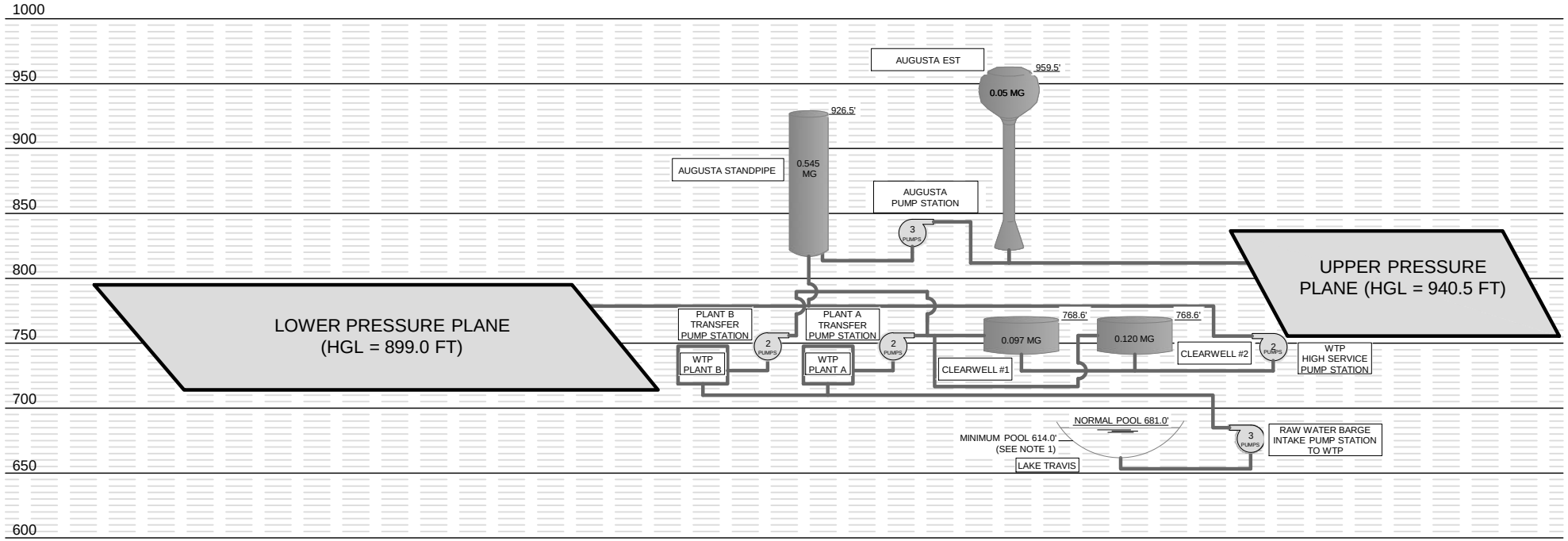

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AUGUSTA STANDPIPE	30.00	822.00	926.50	104.50	545,122	GROUND AND ELEVATED STORAGE FOR LOWER PRESSURE PLANE
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ABBREVIATIONS

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GAL	GALLON
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MG	MILLION GALLON
MSL	MEAN SEA LEVEL (FT)
WTP	WATER TREATMENT PLANT

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EXHIBIT I

PROPOSED PRESSURE PLANE SCHEMATIC

WATER SYSTEM ANALYSIS
TRAVIS COUNTY W.C.& I.D. POINT VENTURE
POINT VENTURE, TX

Drawn By: KP	Checked By: DV	Scale: N.T.S.	Date: 6/7/2023

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RECOMMENDED IMPROVEMENTS

PRIORITY	PROPOSED IMPROVEMENT	COST
1	***AUGUSTA STANDPIPE REPLACEMENT***	
	Construction	$ 1,929,054.00
	Contingency	$ 675,169.00
	Design	$ 325,528.00
	Construction Administration	$ 65,106.00
	Tank Welding & Coating Inspection	$ 65,106.00
	Total	$ 3,059,963.00
2	***AUGUSTA PUMP STATION REHABILITATION***	
	Construction	$ 580,169.00
	Contingency	$ 203,060.00
	Design	$ 97,904.00
	Construction Administration	$ 19,581.00
	Total	$ 900,714.00
3	***6" WATERLINE FROM NICKLAUS DRIVE TO CHAMPIONS CIRCLE***	
	Construction	$ 360,922.00
	Contingency	$ 14,170.00
	Design	$ 60,906.00
	Construction Administration	$ 12,182.00
	Total	$ 560,333.00
4	***PRV ASSEMBLY***	
	Construction	$ 97,266.00
	Contingency	$ 34,044.00
	Design	$ 16,414.00
	Construction Administration	$ 3,283.00
	Total	$ 151,007.00
5	***AUGUSTA EST REHABILITATION***	
	Construction	$ 429,135.00
	Contingency	$ 150,198.00
	Design	$ 72,417.00
	Construction Administration	$ 14,484.00
	Tank Welding & Coating Inspection	$ 14,484.00
	Total	$ 680,718.00
6	***6" WATERLINES FOR LUE REALLOCATION***	
	Construction	$ 219,162.00
	Contingency	$ 76,707.00
	Design	$ 36,984.00
	Construction Administration	$ 7,397.00
	Total	$ 340,250.00
7	***2" WATERLINE REPLACEMENTS***	
	Construction	$ 323,054.00
	Contingency	$ 113,069.00
	Design	$ 54,516.00
	Construction Administration	$ 10,904.00
	Total	$ 501,543.00
	SUMMATION TOTAL	**$ 6,194,528.00**

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RECOMMENDED IMPROVEMENTS

PRIORITY 1 – AUGUSTA STANDPIPE REPLACEMENT

- Augusta Standpipe will be replaced to meet elevated storage capacity, address low pressure issues and operational deficiencies, and increase available storage capacity within the Lower Pressure Plane
- Bolted steel to welded steel tank style
- Diameter to remain constant at 30’-0”
- Increase height from 56’-0” to 104’-6”
- Provide min. 45 psi (at the meter box)
- Elevated storage increase from 16,000 to 138,000 gallons
- Total nominal storage capacity increase from 300,000 to 550,000 gallons
- Replacement will entail:
  - Demolition of existing tank & foundation
  - Temporary tanks/bypass pumping
  - New tank & foundation, incl. piping/valving/coatings
  - Electrical and control modifications
  - Site improvements
- Project Cost: $3,059,963

Trihydro

RECOMMENDED IMPROVEMENTS

PRIORITY 2 – AUGUSTA PUMP STATION REHABILIATION

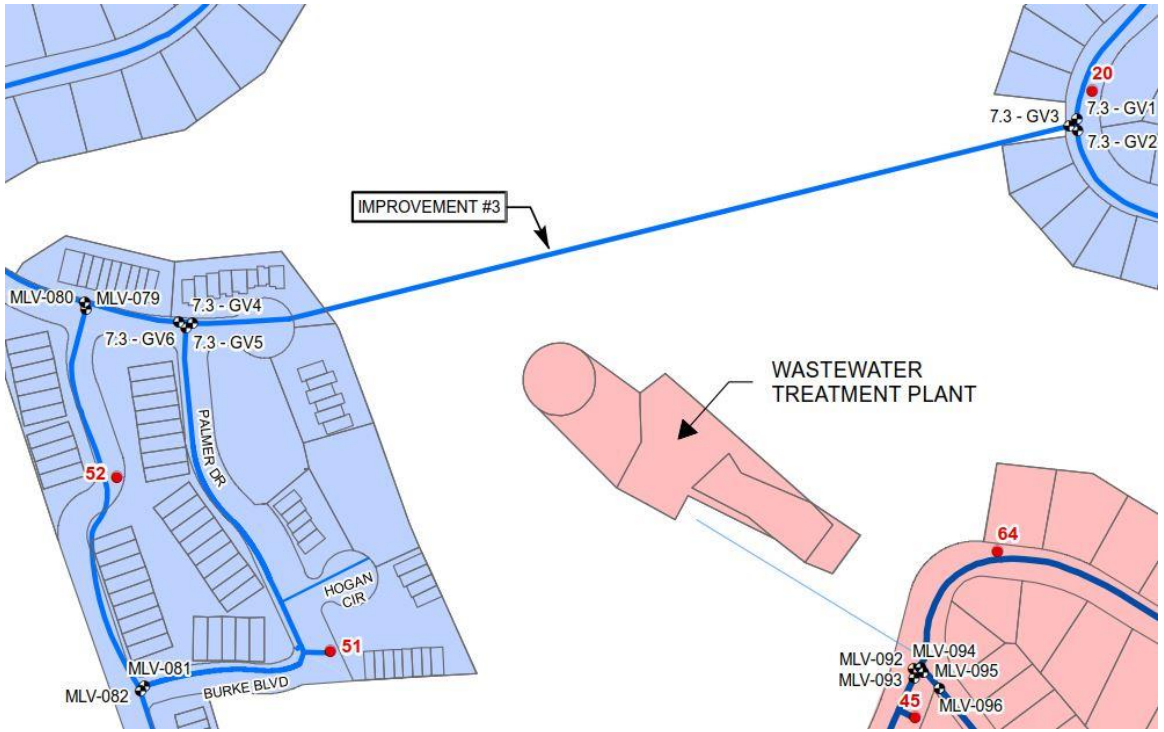
- Augusta Pump Station will be rehabilitated to meet service pump capacity requirement of 1,000 gpm
- 3 pumps (2 running, 1 spare) each rated 500 gpm @ 184’ TDH
- Rehabilitation will include:
  - Demolition of existing pumps and equipment
  - New pumps, piping, valving, coatings
  - New generator & automatic transfer switch
  - New electrical and controls
  - Building modifications
- Project Cost: $900,714

Trihydro

RECOMMENDED IMPROVEMENTS

PRIORITY 3 – 6” WATERLINE FROM NICKLAUS DRIVE TO CHAMPIONS CIRCLE

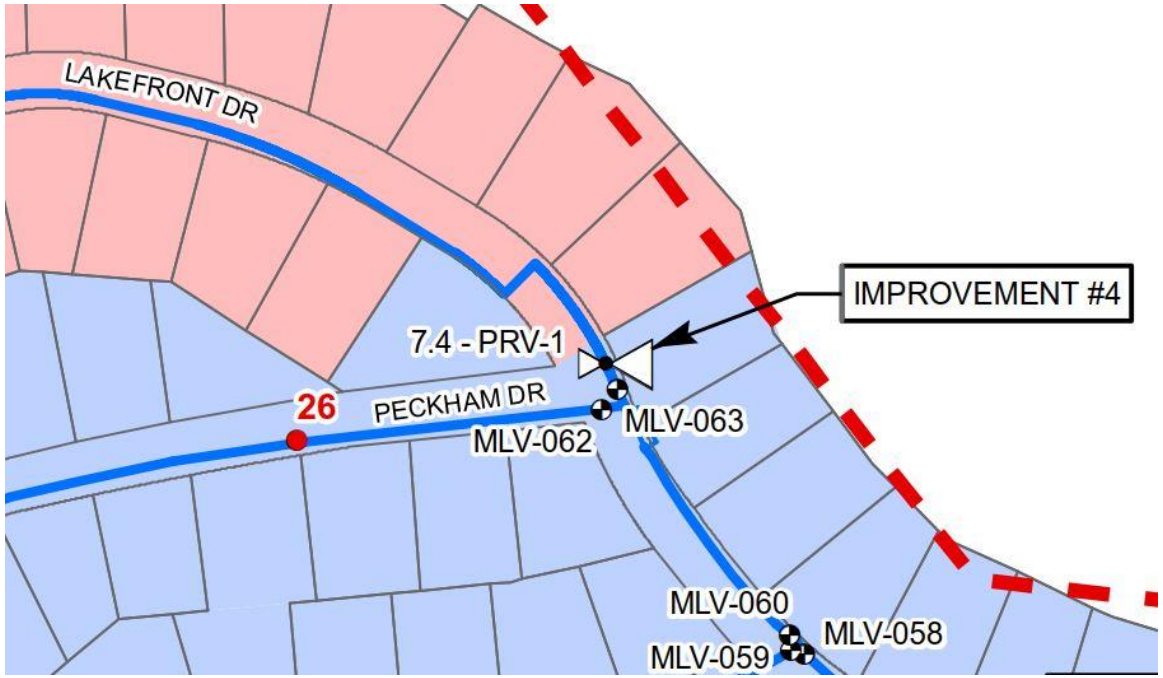
- Increase fire flow in the Demarett Drive and Palmer Drive neighborhood
- Project will entail:
  - 1,155-LF of 6” piping w/ fittings including gate valves
  - Pavement repair
- Project Cost: $560,333



RECOMMENDED IMPROVEMENTS

PRIORITY 4 – PRV ASSEMBLY

- PRV assembly to be installed on north side of Peckham Drive and Lakefront Drive intersection
- This will improve the fire flow availability within the Lower Pressure Plane
- Project will entail:
  - 15-LF of 6” piping with fittings
  - 7’-6” x 4’-6” x 5’-0” concrete valve vault
  - Asphalt pavement repair
- Project Cost: $151,007



RECOMMENDED IMPROVEMENTS

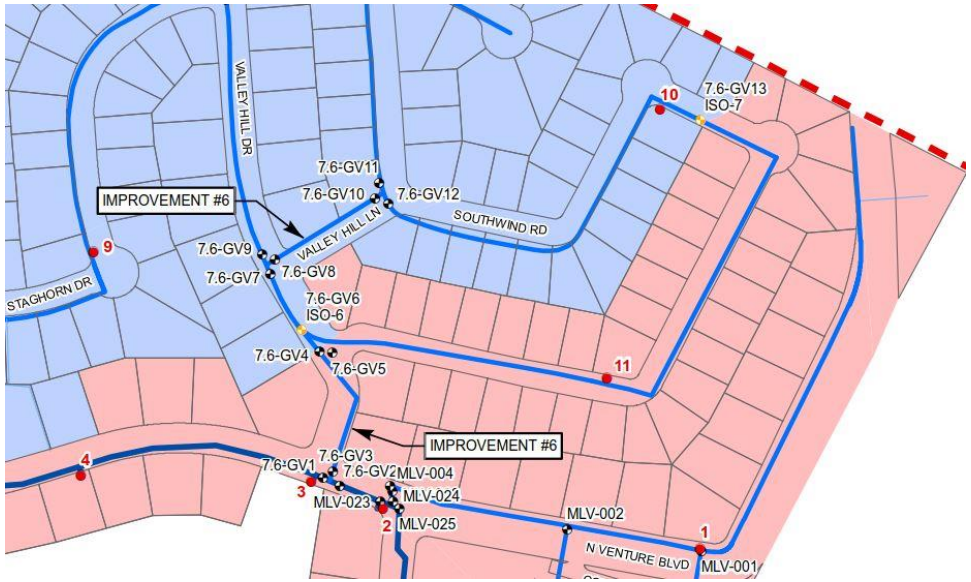
PRIORTY 5 – AUGUSTA EST REHABILIATION

- Augusta EST will be rehabilitated to bring the tank into compliance with TCEQ and AWWA standards and address operational deficiencies.
- Rehabilitation will include:
  - Sandblasting and coating tank interior and exterior
  - Removal and replacement of various tank appurtenances such as roof vent, interior bowl ladder, access hatches, and 8” inlet/outlet pipe
  - Rehab access tube, roof manways, and pipe supports
  - New pressure transmitter assembly
  - New level gauge/sample connection
- Project Cost: $680,718

RECOMMENDED IMPROVEMENTS

PRIORTY 6 – 6” WATERLINES FOR LUE REALLOCATION

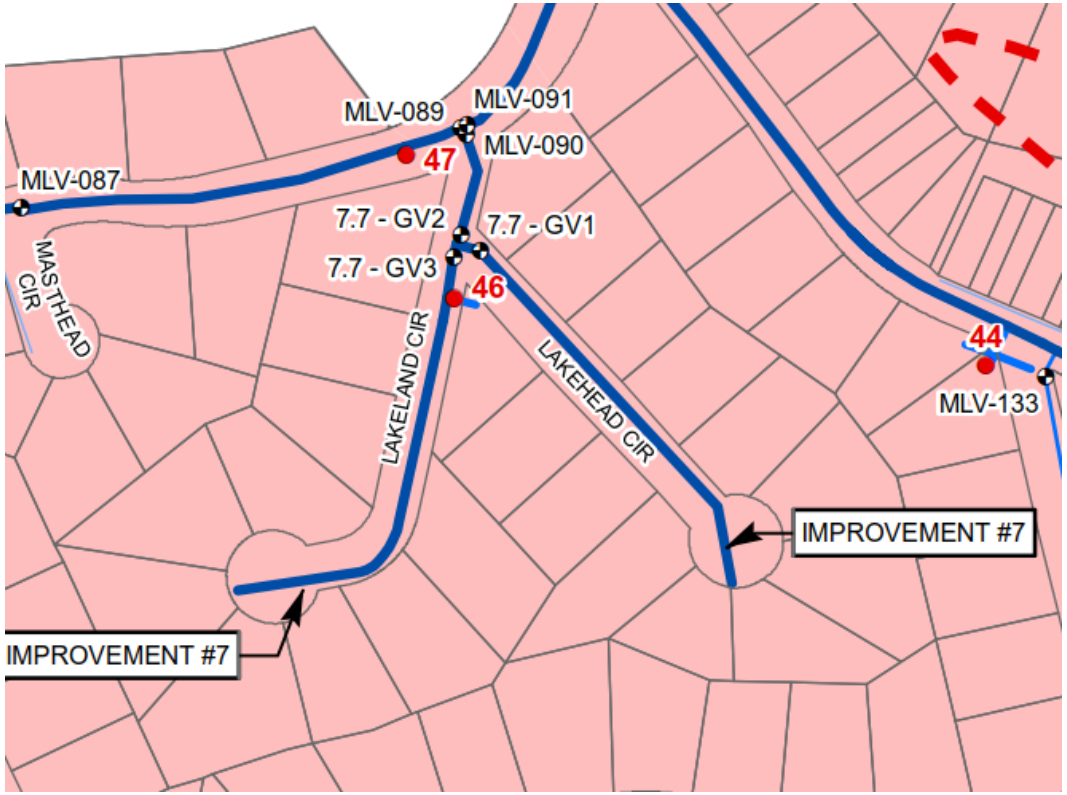
- Installation of 6-inch waterline along Valley Hill Drive between Southwind Road and Venture Drive
- Installation of 6-inch waterline along Valley Hill Lane between Southwind Road and Valley Hill Drive
- These improvements will reallocate 35 LUEs from the Upper to the Lower Pressure Plane because the Augusta EST can only provide capacity for up to 500 LUEs
- Project will entail:
  - 580-LF of 6” piping
  - 3 8-inch gate valves
  - 10 6-inch gate valves
  - Pavement repair
- Project Cost: $340,250

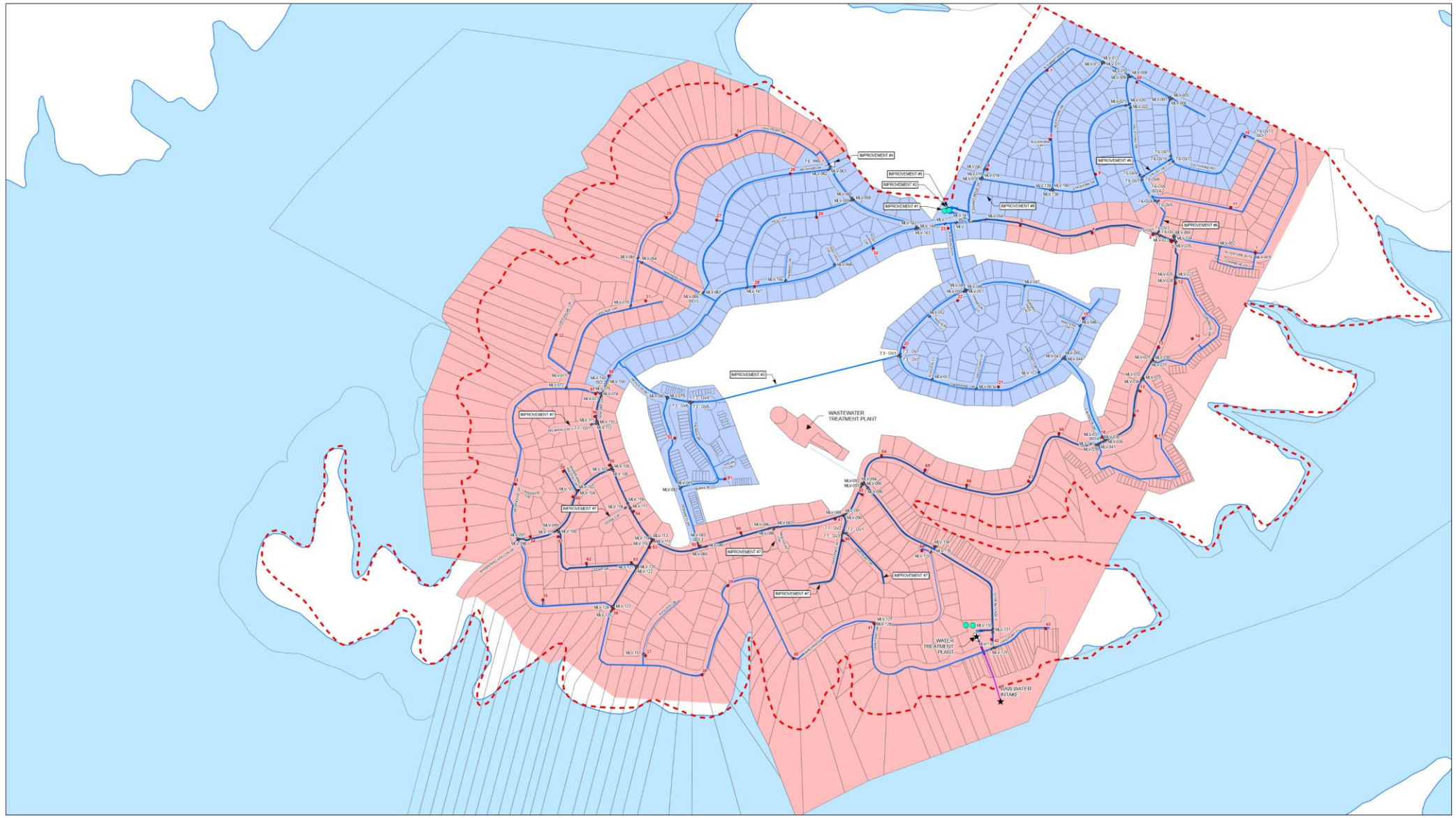


RECOMMENDED IMPROVEMENTS

PRIORITY 7 – 2” WATERLINE REPLACEMENTS

- Replace 2-inch waterlines with 8-inch waterlines at Lakehead Circle and Lakeland Circle
- Upsizing the waterlines since the number of connections exceed capacity for a 2-inch size line.
- Provide additional capacity and fire flow for these cul-de-sac areas.
- Replacement will include:
  - 1,000-LF waterline abandonment
  - 1,000-LF 8” PVC pipe
  - (3) 8” gate valves
  - Pipe fittings and service saddles/corp stops
  - Pavement repair
- Project Cost: $501,543





EXPLANATION

- WATER TREATMENT PLANT
- RAW WATER INTAKE
- WATER TANK
- FIRE HYDRANT
- GATE VALVE
- PRESSURE PLANE ISOLATION GATE VALVE
- PRESSURE REDUCING VALVE

WATER LINES

- MAIN PIPELINE - 10"
- MAIN PIPELINE - 8"
- MAIN PIPELINE - 6"
- MAIN PIPELINE - 4"
- MAIN PIPELINE - 2"

RAW WATER LINES

- RAW WATER LINE - 8"
- RAW WATER LINE - 6"
- CCN
- TRAVIS COUNTY LAND PARCEL - SITE
- UPPER PRESSURE PLANE
- LOWER PRESSURE PLANE

ABBREVIATIONS

CCN - CERTIFICATE OF CONVENIENCE AND NECESSITY.
ISO - ISOLATION
MLV - MAIN LINE VALVE

N

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EXHIBIT K

PROPOSED WATER SYSTEM MAP

TRAVIS COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT POINT VENTURE, TEXAS

Drawn By: DH	Checked By: KP	Scale: 1 " = 330 '	Date: 6/9/23	File: ModelExhibitK.mxd

CONCLUSION

- Hydraulic modeling and system evaluation indicates there are several deficiencies in the water system.
- Projected growth is expected to increase number of LUEs to 1,190 by Year-2029 at full build-out.
- These deficiencies and future growth will require improvement projects to be implemented.
- Seven (7) priority improvement projects were identified to meet TCEQ requirements, meet fire flow requirements, and increase pressure at locations that are known to have low pressures currently
- Total cost of improvements: $ 6,194,528

Trihydro

Questions?