Water Treatment and Supply
City of Killeen June 7, 2022

Proposed Lake Belton Plant Expansion

Water Treatment and Supply

Proposed Lake Belton Plant Expansion

- Introduction
  - -WCID 1
  - -water supply sources
- Background
  - -Completion of Stillhouse Water Treatment Plant
  - -Status of water supply and water treatment capacity
  - -Census update and growth
- Limited Opportunity for expansion
- Proposed Lake Belton Plant Expansion with cost
- Treatment Capacity Summary
- Other Capital Projects ready, or near ready to go
- Questions

BACKGROUND
THE BEGINNING-FORT HOOD

Fort Hood
Killeen, Texas

The War Department announced the selection of Camp Hood in January 1942. Most utilities were in place by August 1942.

Type	Army post
Coordinates	31°08’N 97°47’W / 31.13°N 97.78°W / 31.13; -97.78Coordinates: 31°08’N 97°47’W / 31.13°N 97.78°W / 31.13; -97.78
Built	1942

Camp received water from a transmission line on the Lampasas River near the Dam on Lake Stillhouse.

DISTRICT BACKGROUND
LAKE BELTON CONSTRUCTION

- Construction of the lake started in 1949 and was completed in 1954
- Cost to build-$17 million
- Conservation pool level=594 feet above sea level
- Between 1949 and 1954, the Army constructed a 12 MGD treatment plant on Lake Belton because the water from the Lampasas River was not adequate to serve the Base and Killeen

CREATION OF DISTRICT

- City of Killeen needed water and Ft. Hood wanted to assist City
- Department of Army ruling prohibited Ft. Hood from being in the wholesale water business and selling water to any City
- Bell County WCID #1 was created in March 1952 to be the vehicle to sell water to Killeen and other area cities by leasing the plant from the Army.

Capacity

Water Rights Summary

Entity	Two Tier Water (Option/Election Use)	System Water	Other Water Rights	Total Water Rights
Killeen	29,964	10,000	-	39,964
Copperas Cove	7,824	1,000	-	8,824
Belton	4,966	1,000	2,500	8,466
Harker Heights	5,265	-	3,235	8,500
WCID #3	740	750	-	1,490
439	750	-	1,409	2,159
District	-	250	-	250
Totals	49,509	13,000	7,144	69,653

Finished Water

A PHOTOGRAPHIC PROFILE

https://doi.org/10.1002/opfl.tk

A slanted tube intake assembly (inset) was installed at Stillhouse Hollow Lake, providing a new supply source for Bell County, Texas, residents with the completion of the new Lake Stillhouse Water Treatment Plant.

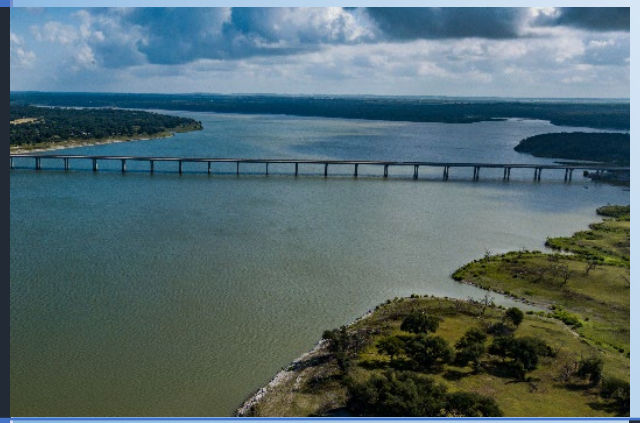
LAKE STILLHOUSE WATER PLANT PROVIDES ADDITIONAL WATER SOURCE FOR 300,000 TEXAS RESIDENTS

Bell County, Texas, located some 50 miles north of Austin, is fortunate to have not one but two water supply reservoirs that are part of the Brazos River system. Lake Belton lies to the northwest portion of the county and is one of the largest water supply reservoirs in the Brazos River Authority system. Lake Stillhouse is on the southwest quadrant of the county. The new Lake Stillhouse Water Plant represents a new supply source for the customers of Bell County Water Control & Improvement District #1 (WCID #1). Formed in 1952 to serve Fort Hood and "it's surrounding civilian communities," WCID#1 serves about 310,000 people primarily in central and west Bell County. The cities of Killeen, Harker Heights, Copperas Cove and Nolanville sponsored the construction of the Lake Stillhouse Water Plant to serve their growing populations.

PROJECT SPECIFICS

Project Name: Lake Stillhouse Water Plant
Operator/Contractor: CSA Construction, Houston, Texas
Designer: CDM-Smith, Austin, Texas
Completion Date: July 1, 2021
Water Source: Lake Stillhouse Hollow
Technology: Conventional Surface Water Treatment
Project Cost: $39 million
Service: The plant delivers 17 mgd of high-quality drinking water and was designed to expand to 34 mgd at build out.
Physical Size: The plant includes two sedimentation trains and four conventional dual media filters. The project also includes a dual slant tube intake and about 3,500 feet of 36-inch raw water line.
Staff Size: 5
Number of Operators: 4, including a chief plant operator
Special Features: The plant's slanted tube intake assembly and installation required a dive team, inflatable ballasts, and tremendous coordination between land and water crews.

PHOTOGRAPHS: TK



Water Demand and WTP Capacity Forecasts

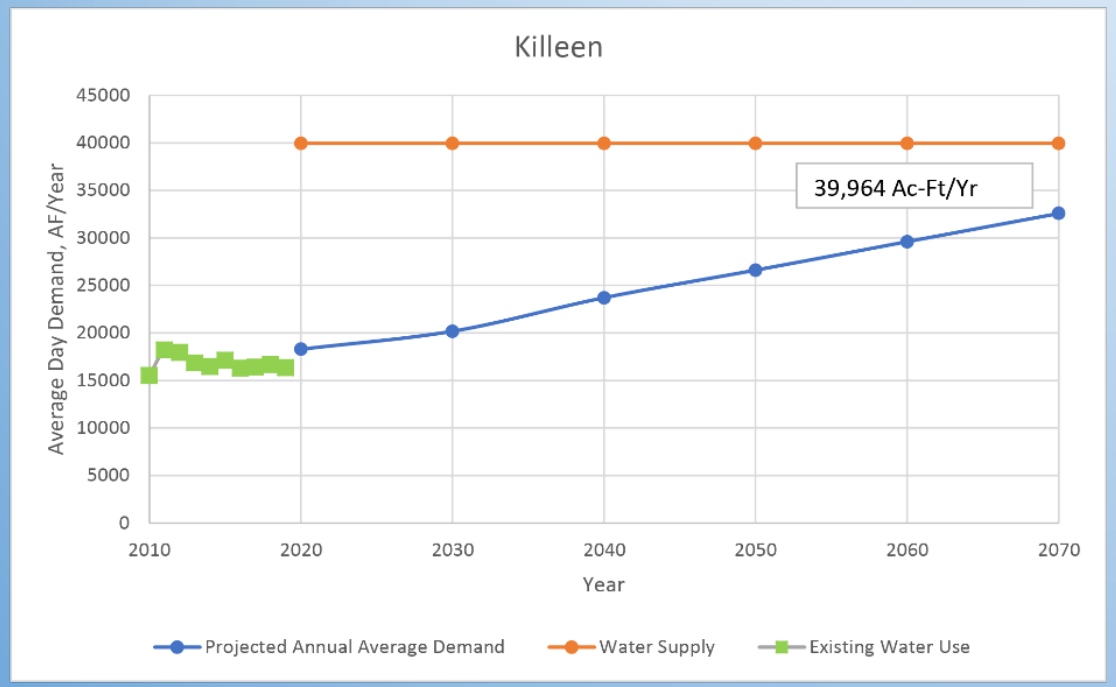
City of Killeen

TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
City of Killeen	144,243	169,560	195,711	221,697	247,195	272,291

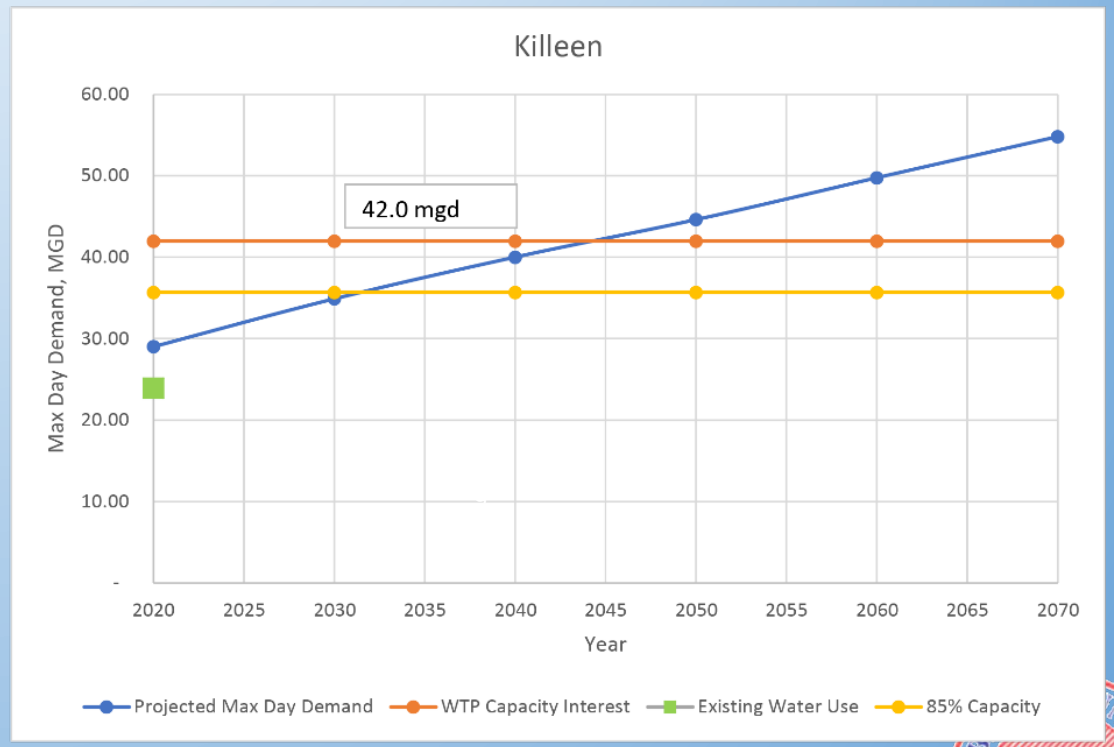
TWDB Region G Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
City of Killeen	19,713	23,702	27,164	30,299	33,783	37,213



Max Day Water Demand Projections (MGD)

Customer Name	2020	2030	2040	2050	2060	2070
City of Killeen	29.04	34.92	40.02	44.64	49.77	54.82



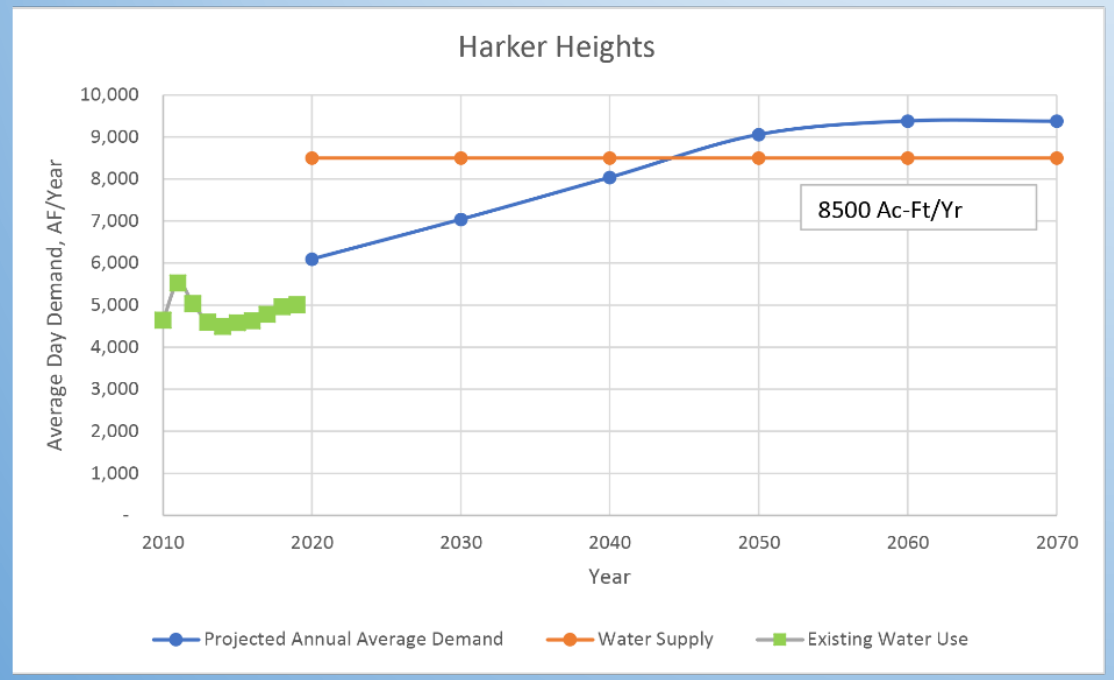
City of Harker Heights

TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
City of Harker Heights	31,372	36,879	42,566	48,218	50,000	50,000

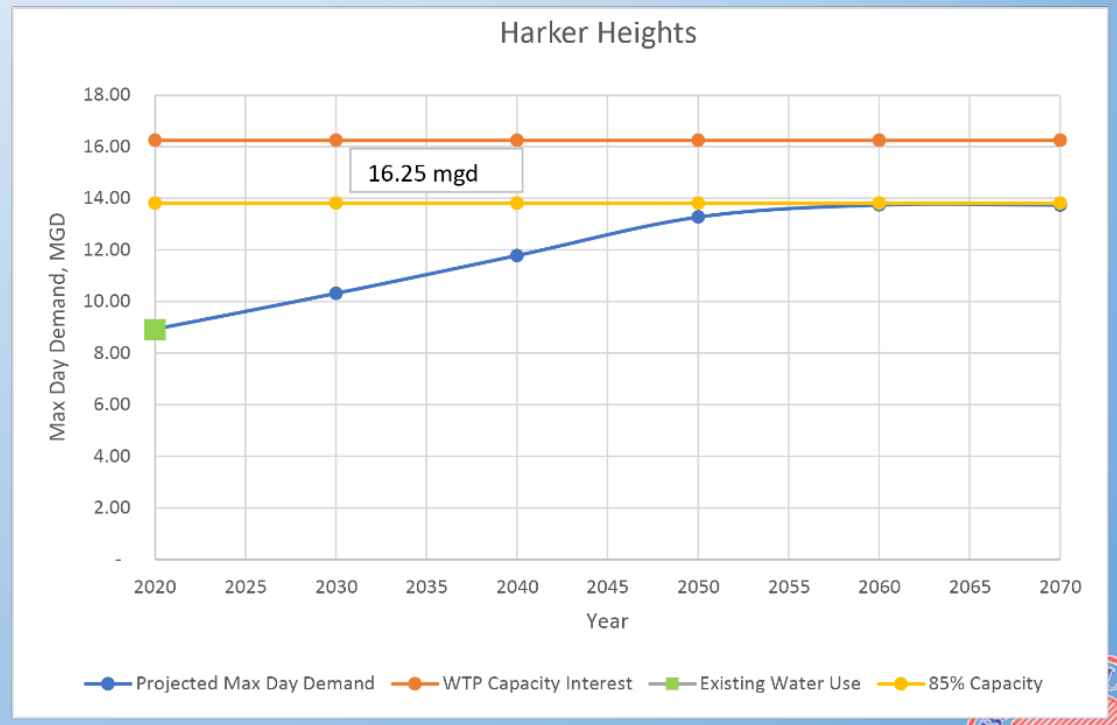
TWDB Region G Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
City of Harker Heights	6,099	7,043	8,042	9,060	9,381	9,377



Max Day Water Demand Projections (MGD)

Customer Name	2020	2030	2040	2050	2060	2070
City of Harker Heights	8.94	10.32	11.78	13.28	13.75	13.74



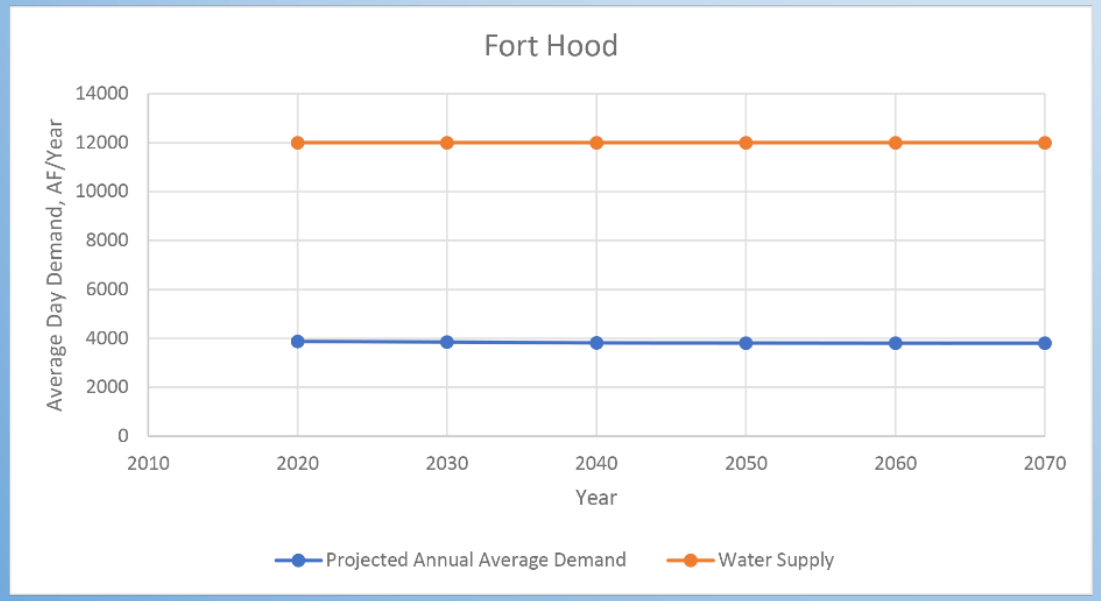
Fort Hood

TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
Fort Hood	16,936	17,196	17,282	17,282	17,282	17,282

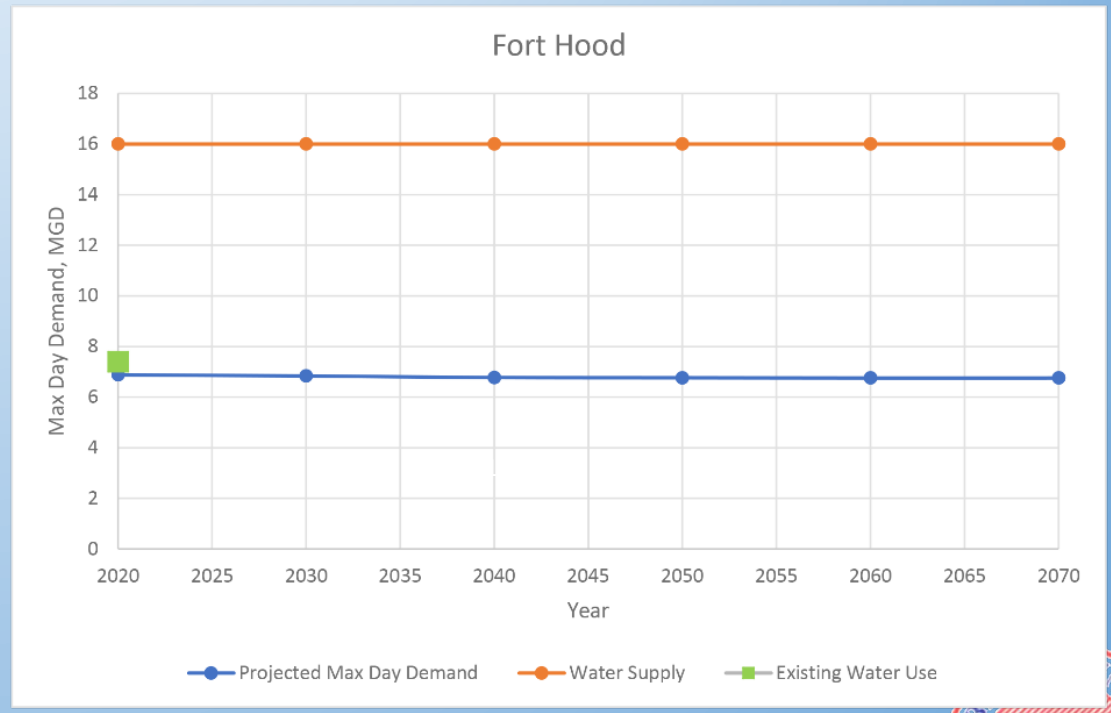
TWDB Region G Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
Fort Hood	3,874	3,850	3,815	3,809	3,804	3,804



TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
Fort Hood	6.88	6.84	6.77	6.76	6.75	6.75



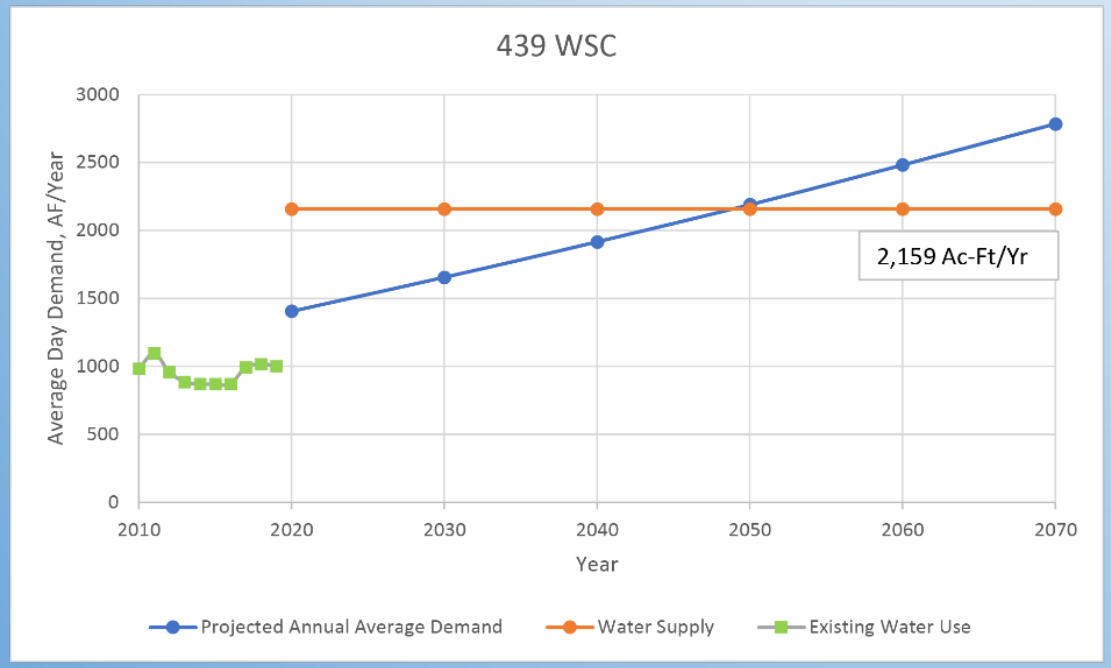
439 WSC

TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
439 WSC	10,220	12,327	14,490	16,700	18,961	21,285

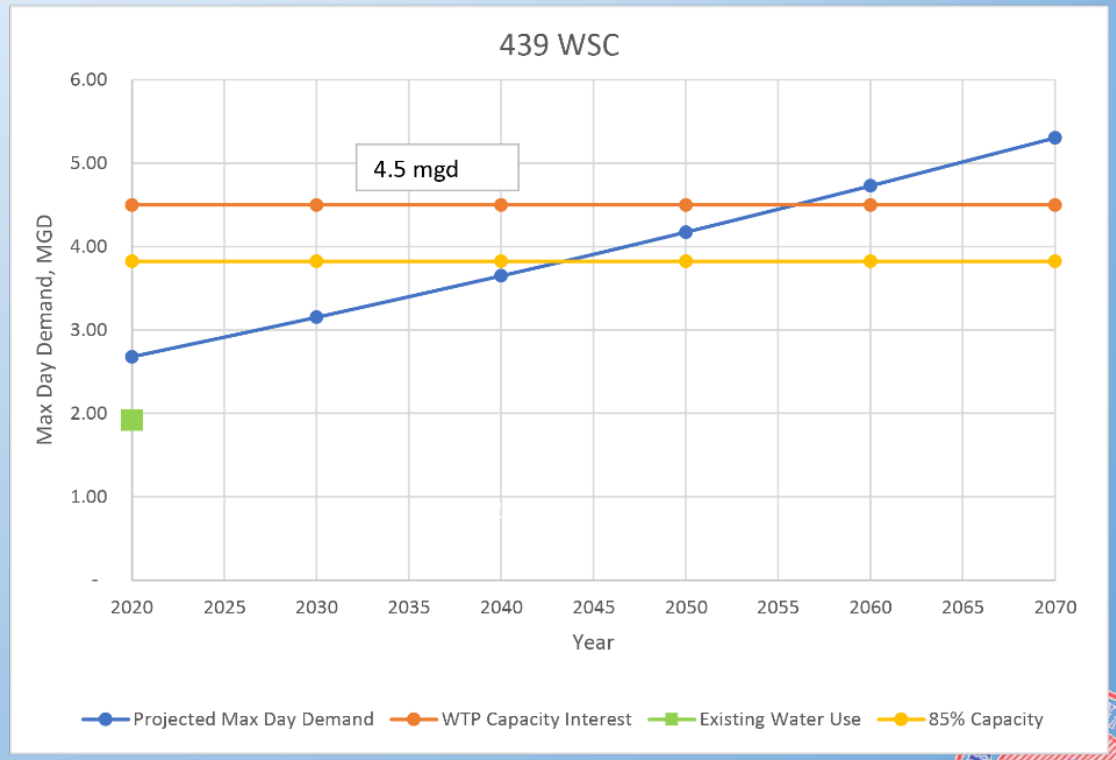
TWDB Region G Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
439 WSC	1,407	1,656	1,917	2,191	2,483	2,785



Max Day Water Demand Projections (MGD)

Customer Name	2020	2030	2040	2050	2060	2070
439 WSC	2.68	3.15	3.65	4.17	4.73	5.30



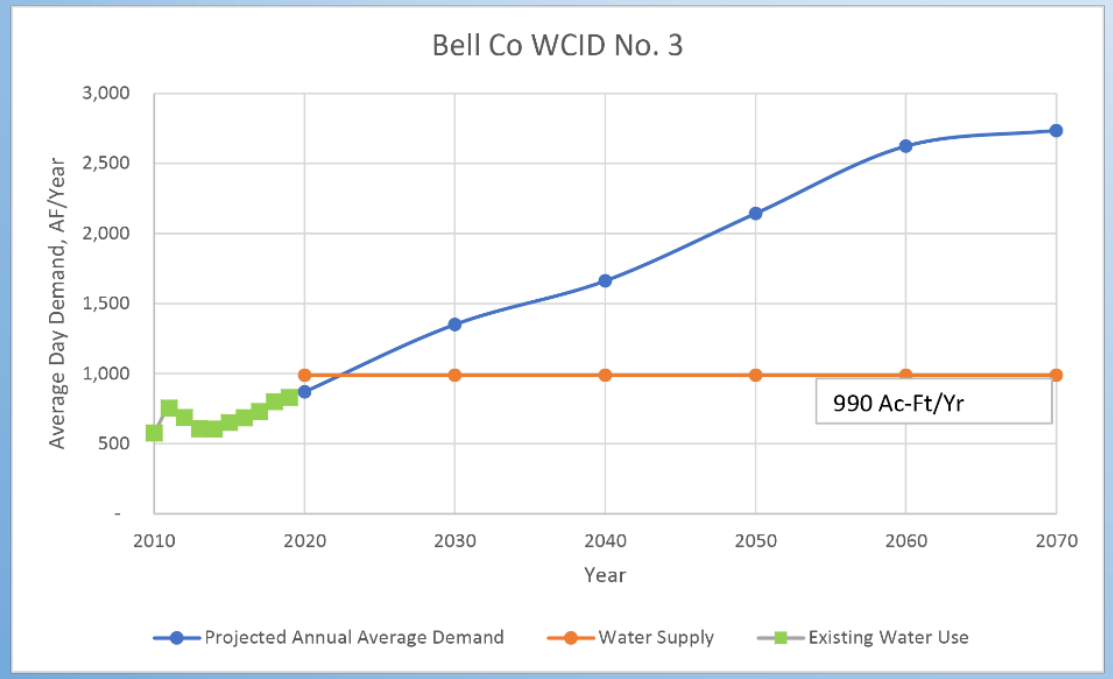
Bell County WCID3 (Nolanville)

TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
Bell County WCID 3	6,100	9,460	11,636	14,996	18,356	19,140

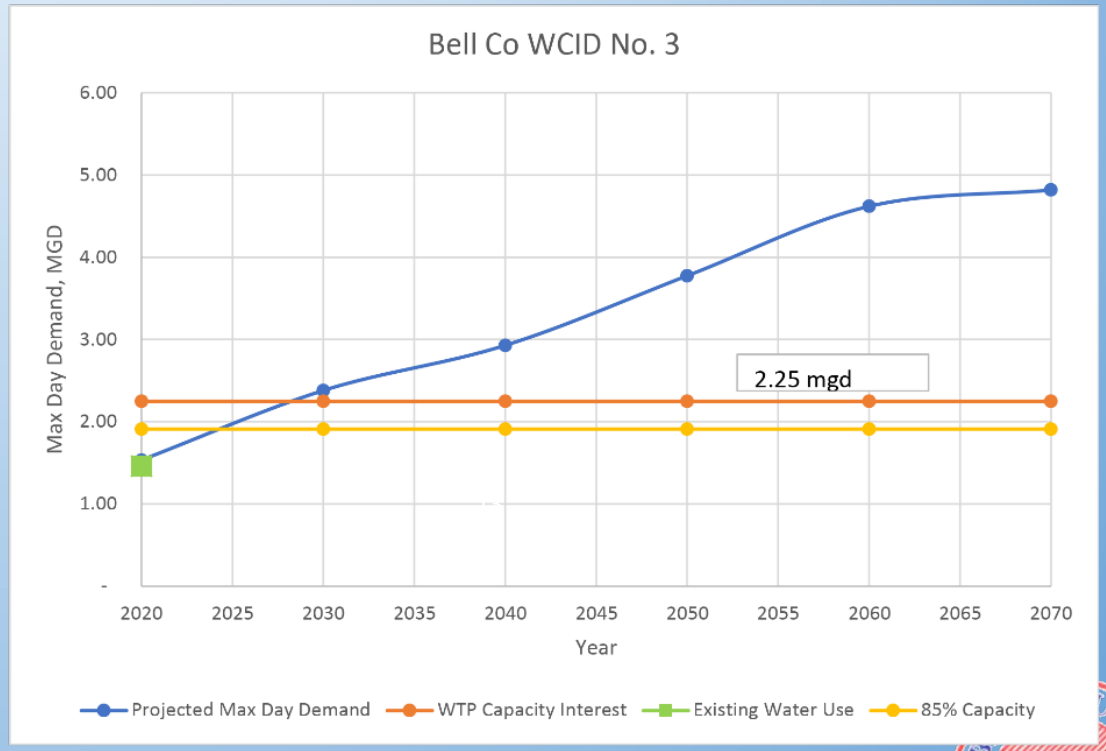
TWDB Region G Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
Bell County WCID 3	872	1,352	1,663	2,144	2,624	2,736



Max Day Water Demand Projections (MGD)

Customer Name	2020	2030	2040	2050	2060	2070
Bell County WCID 3	1.54	2.38	2.93	3.78	4.62	4.82



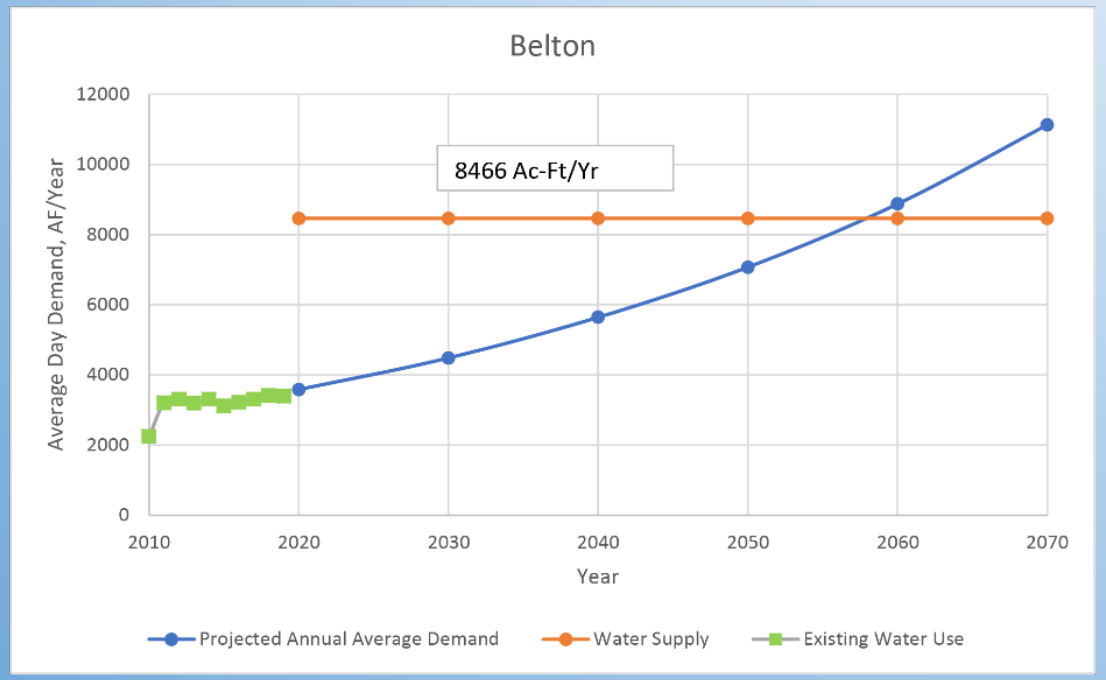
City of Belton

TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
City of Belton	22,850	28,600	36,000	45,100	56,600	71,000

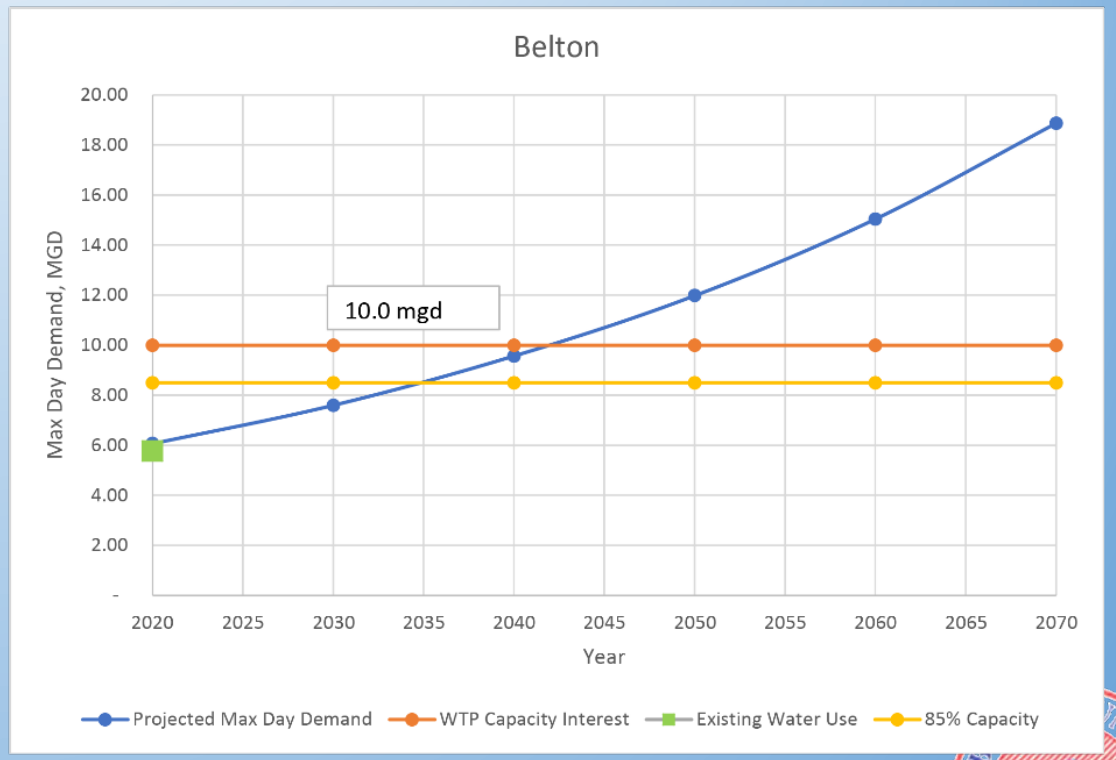
TWDB Region G Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
City of Belton	3,584	4,485	5,646	7,073	8,877	11,135



Max Day Water Demand Projections (MGD)

Customer Name	2020	2030	2040	2050	2060	2070
City of Belton	6.07	7.60	9.57	11.99	15.04	18.87



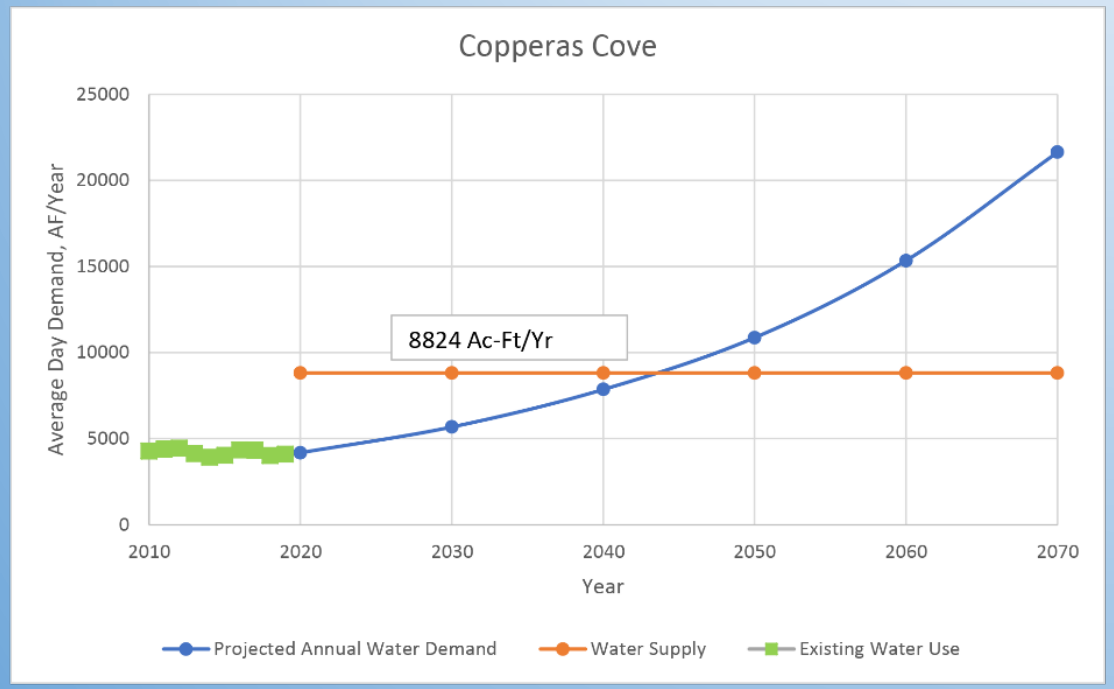
City of Copperas Cove

City of Copperas Cove Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
City of Copperas Cove	35,307	49,804	70,253	99,099	139,790	197,187

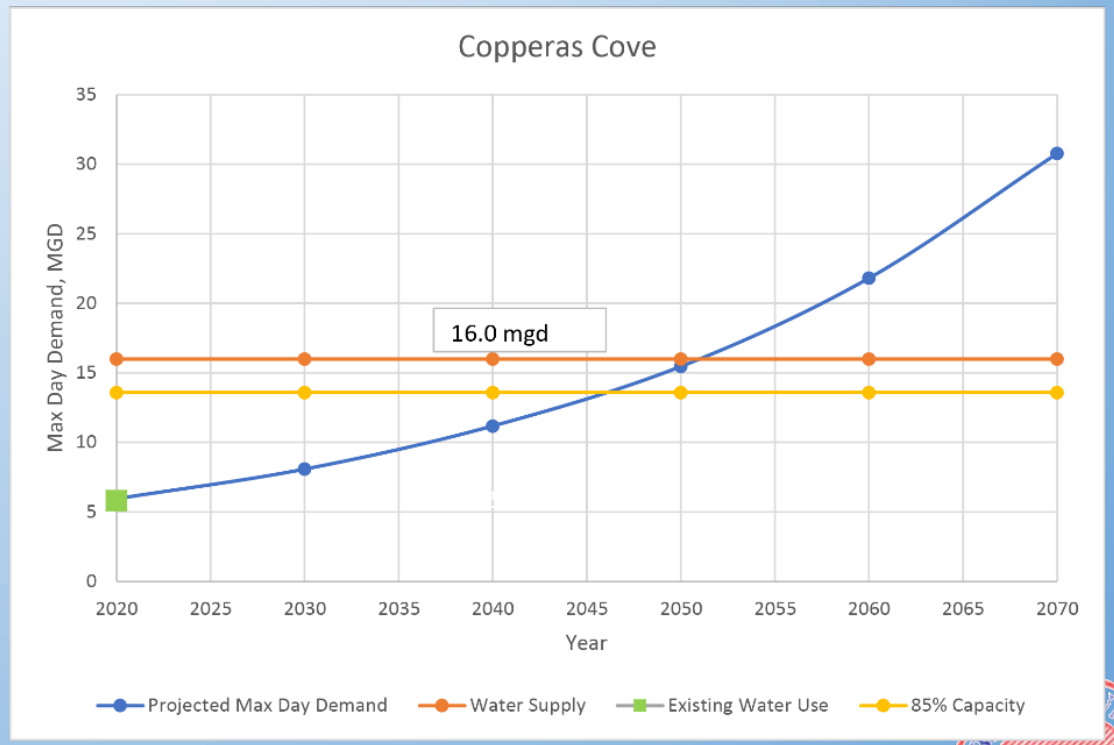
City of Copperas Cove Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
City of Copperas Cove	4,192	5,691	7,870	10,879	15,346	21,648

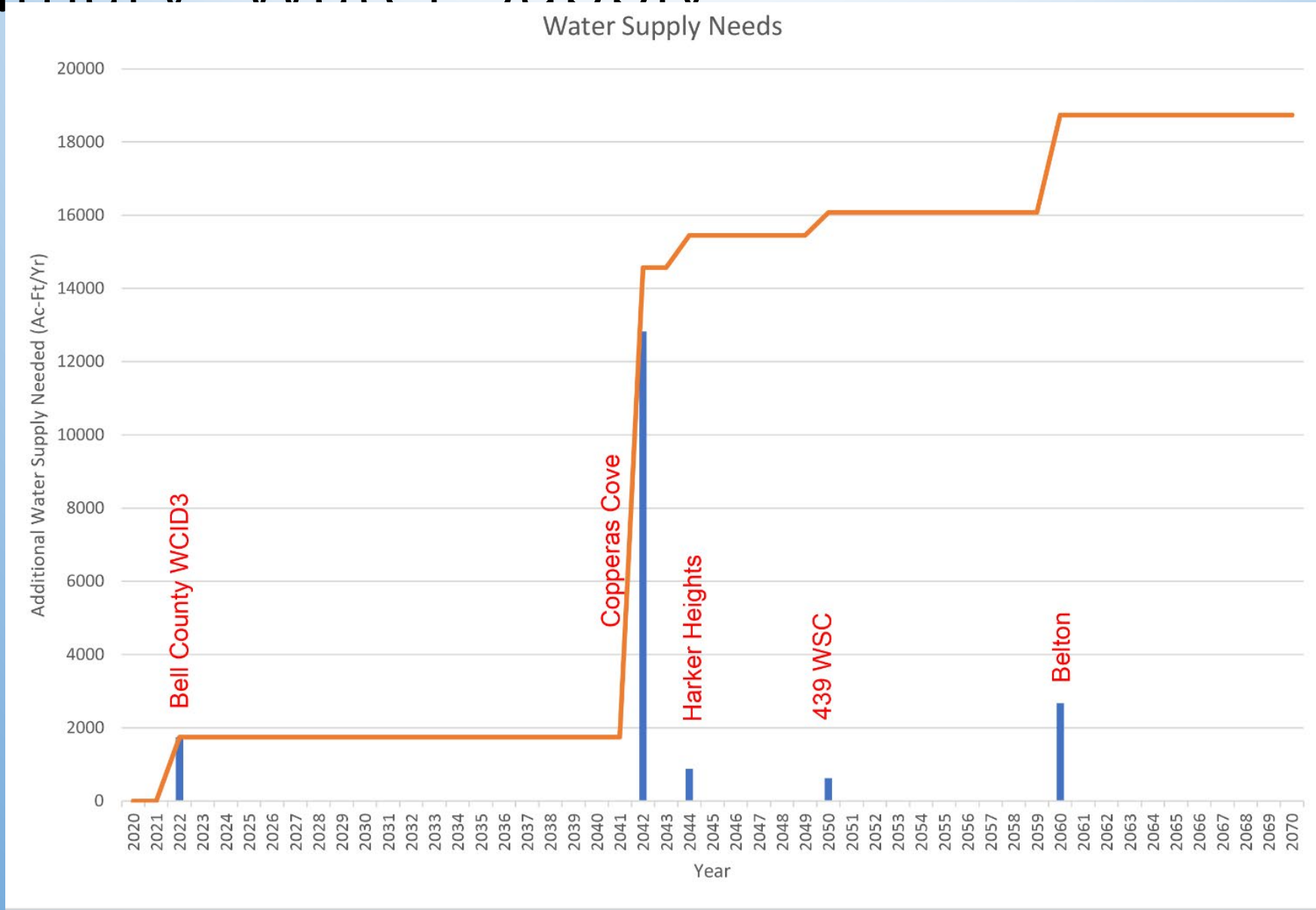


Max Day Water Demand Projections (MGD)

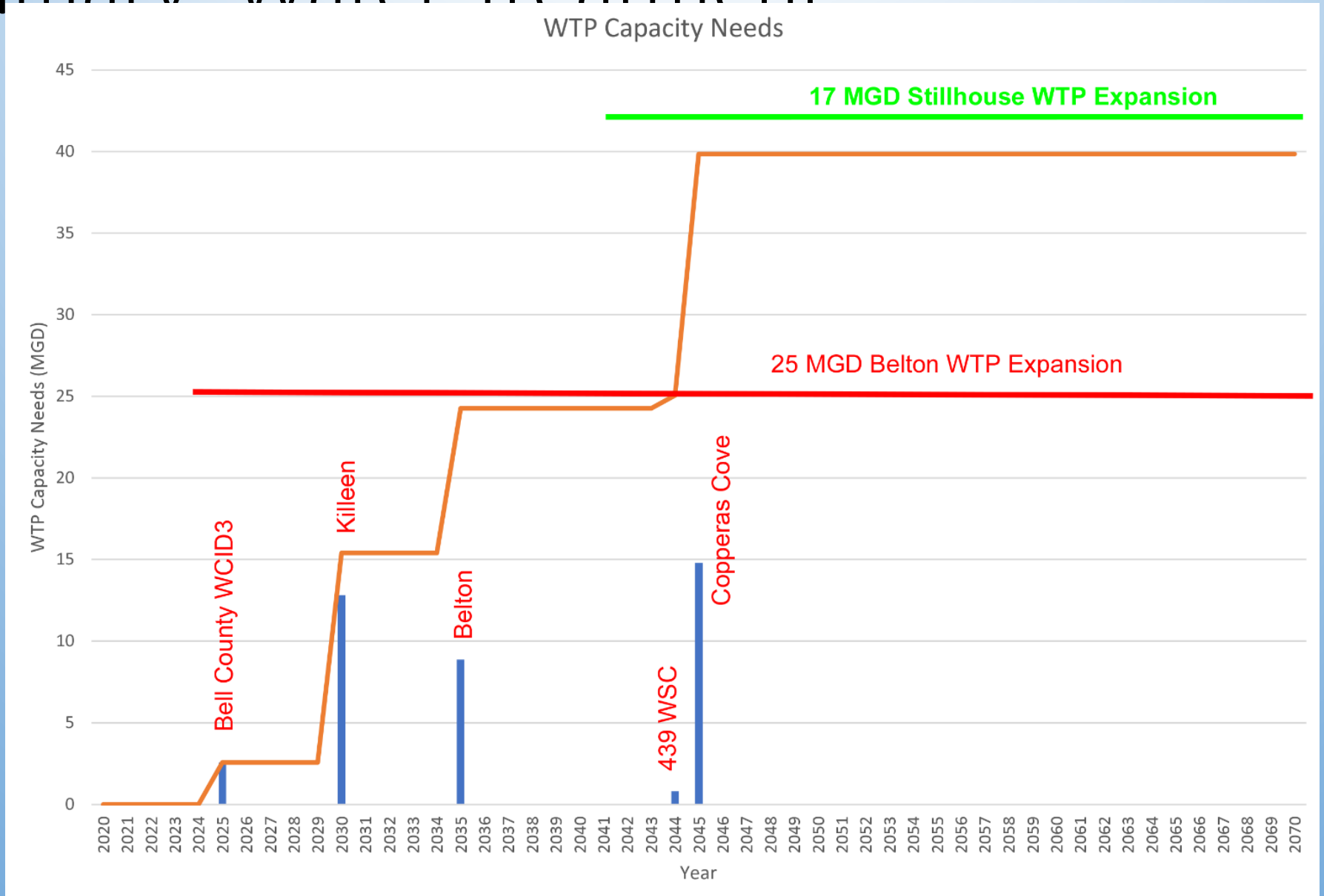
Customer Name	2020	2030	2040	2050	2060	2070
City of Copperas Cove	5.96	8.09	11.19	15.47	21.83	30.79

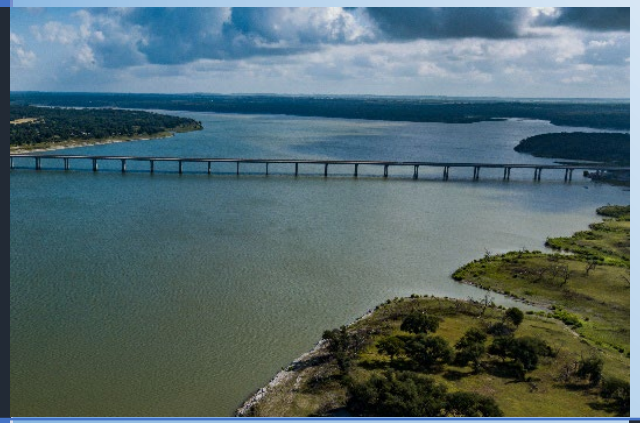


Summary: Water Supply



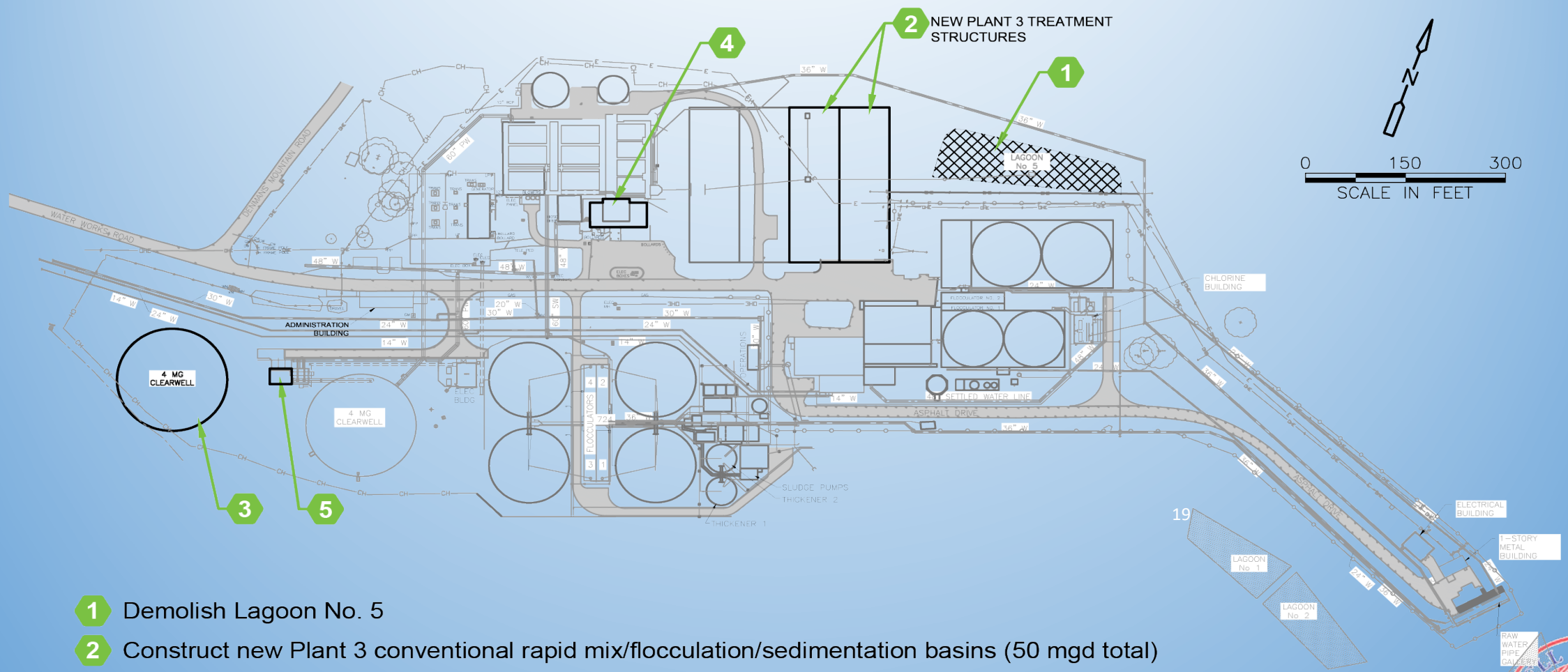
Summary: Water Treatment





WTP Expansion and Timing

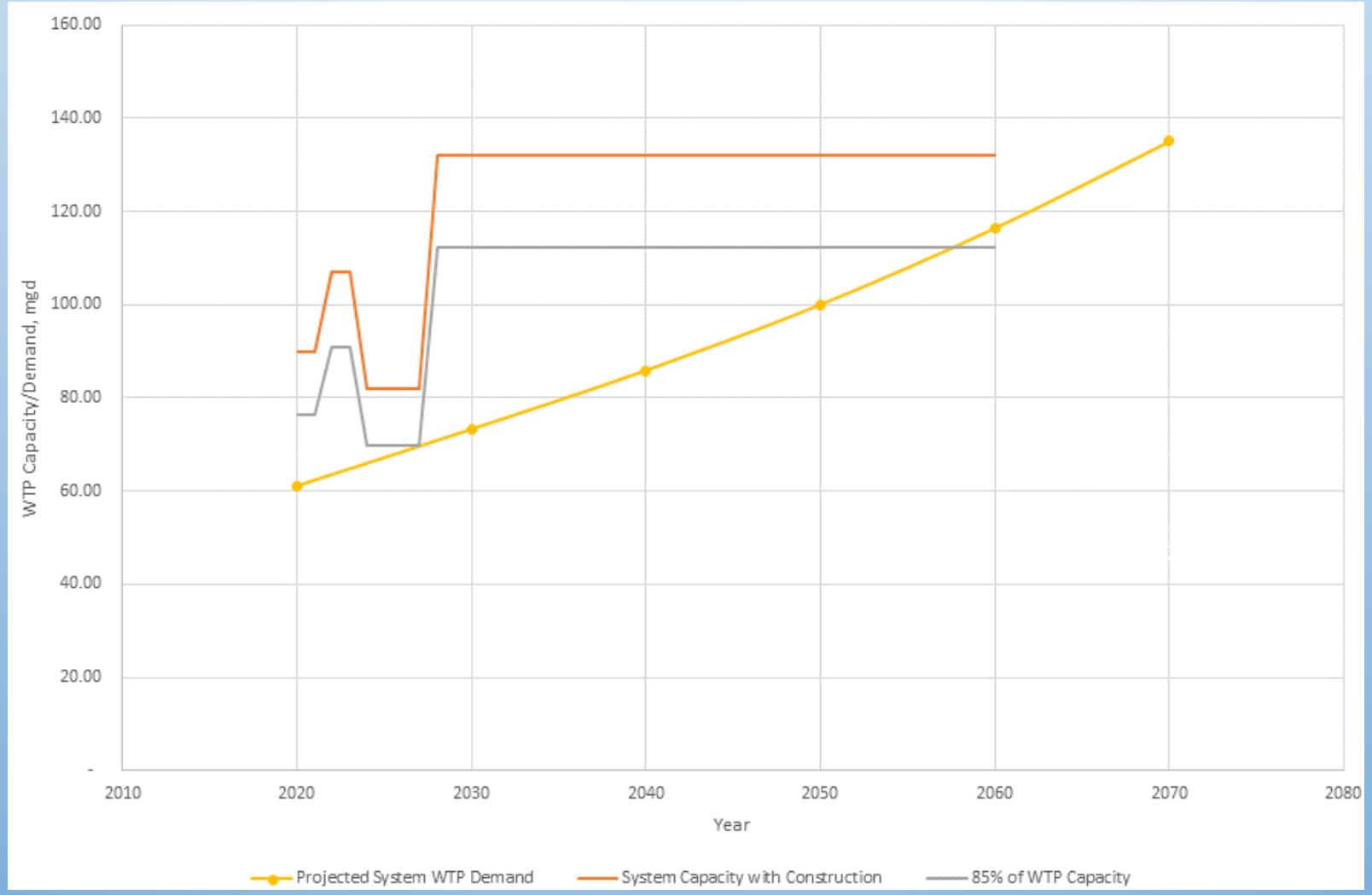
Expansion from 90 mgd to 118 mgd



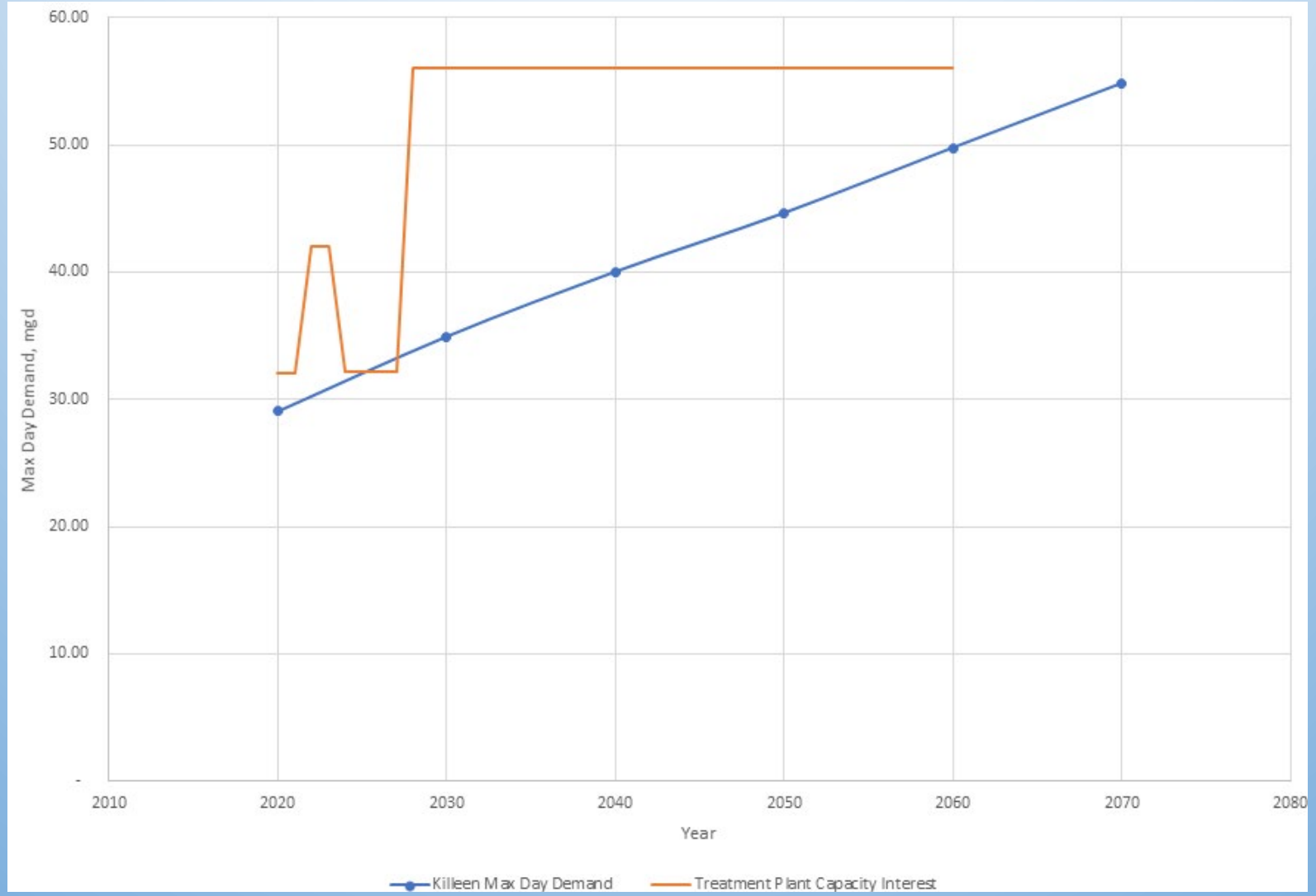
1. Demolish Lagoon No. 5
2. Construct new Plant 3 conventional rapid mix/flocculation/sedimentation basins (50 mgd total)
3. Construct New 4.0 MG clearwell
4. Increase Plant 3 chemical storage and facilities
5. Increase finished water pump capacity

BELTON WTP
FUTURE PLANT EXPANSION

Belton County WCID 1 Demand vs Treatment Capacity with Belton WTP Expansion



Killeen Max Day Demand vs Capacity Interest



Comparison of Region G 2020 Population Projections and 2020 US Census Data

Utility	2020 Census Population	Region G 2020 Population Projection	Difference
Belton	27,411	21,841	5,570
Copperas Cove	39,340	36,989	2,351
Harker Heights	33,989	32,012	1,977
Killeen	157,807	153,371	4,436
Jonah	37,084	12,985	24,099
Taylor	16,755	17,209	(454)
Georgetown	133,582	72,507	61,075

Proposed Lake Belton Plant Expansion

Major Cost Components;

- Modify Raw Water Pump Station with new electrical building.
- New Raw Waterline
- 53 MGD Treatment Structure
- 4 Million Gallon Clearwell
- High Service Pump Station expansion
- Electrical Upgrades
- Minor filter upgrades

Proposed Lake Belton Plant Expansion

Capacity Interest in Expansion

	MGD	% of Total	Cost
Killeen	14	50.0%	$76,280,000.00
Copperas Cove	7	25.0%	
Belton	4	14.3%	
WCID 3	2	7.1%	
439 WSC	1	3.6%	
	28	100%	

Treatment Capacity Summary

- An opportunity exists to expand the Belton Water Treatment Plant by virtue of the Stillhouse Plant coming online and taking some existing burden from the Belton Plant
- This window of opportunity will close once growth to the south and west of Killeen begins to dominate the Stillhouse WTP
- Unless a new source of water becomes available at a later date, the Belton Water Treatment plant expansion opportunity may be lost

Treatment Capacity Summary
continued

- At this time we're recommending that the City of Killeen participate in this opportunity to secure additional treated water for the future.
- The other entities that need or will need water treatment capacity have been informed and have affirmed their capacity designation for the project to move forward.
- All entities cost per gallon of additional capacity is the same.

Other Projects Ready or Near Ready

- Full Capacity Standby Generation at the Lake Belton Water Treatment Plant- this is a Senate Bill 3 project which would provide much needed support in times when the electric grid is down or not at 100%. Full Cost is $12.18 million to be covered by every entity at their capacity percentage. A Defense Economic Adjustment Assistance Grant is being pursued at $5 million, which, if granted would cover the $2.1 million Fort Hood amount and would lessen the portion needed by the remaining entities
- 48 inch Main Replacement- 5,000 feet of 48 inch pipe to replace the section which has been susceptible to ruptures for the past 10 or so years. 90% plans are expected in July or August with a bid date likely in early fall. I don't have an engineers cost estimate yet to share.

Questions?