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FROM:	Paula Feldman, PE
SUBJECT:	Stanton Springs Tank Siting Evaluation
PROJECT:	NCWSA Annual Consulting Services – Task Order #1
DATE:	May 12, 2021



1.00 BACKGROUND

The Newton County Water and Sewer Authority (NCWSA) provides water service to an industrial growth corridor known as Stanton Springs located on the eastern side of Newton County. Existing industrial customers in Stanton Springs with significant water demands include a Facebook data center and Takeda, a biopharmaceutical manufacturer. A new data center will likely be locating in the area soon. Other large water customers are anticipated to locate in the area through 2050.

To supply the water demands requested by the industries, an elevated storage tank (EST) is under consideration for the Stanton Springs area. Two potential tank sites identified by NCWSA are considered in this evaluation: one on Shire Parkway and the other on the southwest corner of the I-20/SR278 interchange, as shown on **Figure 1**.

2.00 HYDRAULIC MODEL

The calibrated hydraulic model developed for the Newton Strategic Water Plan serves as the starting point for this evaluation. The model includes water demand scenarios for forecasted demand years of 2030 and 2050, which include mega-site developments identified during the master planning process on the east side of the County, as well as increased water demands related to population growth. The future data center was added to the model at the end of Shire Parkway, which is the planned location.

For both the 2030 and 2050 water demand scenarios, capital improvements identified in the Strategic Water Plan are included. The model scenarios also include planned near-term improvements, such as the Paine's Crossing pipeline.

Both the Facebook and future data centers have specified demands for three phases of planned facility expansions. The timeframe for phased expansions is not included in the industries' projections; however, for purposes of modeling each phase is assumed to be implemented as shown in **Table 1**, along with water demand needs.

Table 1 - Water Demand Needs for Industrial Customers in Stanton Springs

Customer	Current Maximum Day Demand (gpd)	Maximum Day Demand (gpd)	Minimum Pressure (psi)	Peak Demand	Fire Flow Demand
Facebook Data Center	200,000	Phase 1 (Existing): 180,000 Phase 2 (2030): 360,000 Phase 3 (2050): 450,000	Phase 1: 70 Phase 2: 70 Phase 3: 70	2,500 gpm for 180 min	800 gpm at 70 psi
Takeda	771,000				
Future Data Center		Phase 1 (before 2030): 320,000 Phase 2 (2030): 640,000 Phase 3 (2050): 960,000		2,500 gpm	

Note: psi = pounds per square inch, gpd = gallons per day, gpm = gallons per minute

The 2030 model indicates the system cannot sustain the peak industrial demands at the requested pressures without additional piping improvements due to high velocity and headloss along Social Circle Highway (SR 11) and SR 278. Considering the long-term needs of the area and desire for enhanced resilience, an elevated storage tank is being considered. The documented spikes and variation in working pressure also create a need for dampening.

3.00 EST EVALUATION SUMMARY

With two potential tank site locations, the goal of this evaluation is to assess the following at each location:

1. Tank Size: 1- or 2-million-gallon (MG) tank
2. EST overflow elevation and tank height
3. Tank operations
4. Ability to supply peak demands
5. Ability to meet requested fire flow demands and residual pressures
6. Impact on pressure

A hydropillar composite elevated storage tank is NCWSA’s preference for this location due to aesthetics and lower operations and maintenance costs. Based on information obtained from Caldwell Tank on composite elevated storage tanks, the anticipated tank diameter and operating range are shown in **Table 2**.

Table 2 - Tank Dimensions

EST Size	Diameter (feet)	Head Range (feet)
1 MG	74	35
2 MG	98	42

The overflow elevation is the key parameter to establish for each tank location. Several overflow elevations were modeled through a 48-hour simulation to establish the hydraulic grade at which the tank functions most effectively in terms of turn over (not remaining full through the day) and ability to refill within a 24-hour period. The recommended tank overflow elevations and resulting tank heights are presented in **Table 3**.

Table 3 - Tank Overflow Elevation and PRV Setting

	Option 1	Option 2
	Shire Parkway Tank	I-20 Interchange Tank
Overflow Elevation (feet)	890	895
Ground Elevation (feet)	723	772
Tank Height (feet)	167	123

A pressure reducing valve (PRV) modeled on the east side of the intersection of SR 11 (Social Circle Hwy) and SR 278 creates a separate pressure zone for the Stanton Springs area, allowing for a lower overflow elevation and tank height. Through an iterative process, a PRV setting was established that accomplishes several overlapping goals of tank overflow elevation and height, tank turnover and maintaining minimum pressures in the zone. The pressure reducing valve is modeled with a downstream pressure setting of 77 psi.

Using the information presented in Tables 2 and 3, several simulations were conducted to assess the tanks' ability to maintain pressures while providing maximum day demands, peak demands and fire flow demands in the Stanton Springs area for both the 2030 and 2050 demand conditions. Key points from the evaluation include the following:

1. For the Shire Parkway EST Location:
 - a. Pressures at Facebook range from 76 to 78 psi in the model with maximum day demands.
 - b. Under the fire flow demand requested at Facebook (800 gpm at 70 psi), the pressure remains above 70 psi for both the 2030 and 2050 demand conditions.
 - c. The peak demand of 2,500 gpm at Facebook is satisfied with a pressure of 45 psi; the pressure quickly rebounds following delivery of the peak demand.
 - d. For the 2050 simulation, the addition of a 12-inch pipe on Shire Parkway, paralleling the existing 12-inch from Facebook to the new tank is needed due to high velocities in the existing 12-inch water main along Shire Parkway.
2. For the I-20 Interchange EST Location:
 - a. Pressures at Facebook range from 76 to 78 psi in the model with maximum day demands.
 - b. Under fire flow conditions at Facebook (800 gpm at 70 psi), the pressure is above 70 psi.
 - c. The peak demand of 2,500 at Facebook and the new Data Center is satisfied with a pressure of 45 psi; the pressure quickly rebounds following delivery of the peak demand.
 - d. For the 2050 simulation, the addition of a 12-inch pipe north of Takeda and completes a loop at the new data center provided two routes for water to be supplied to the industrial customers.

3. Tank Size:
 - a. With the 2030 and 2050 forecasted demands for the Stanton Springs area, the 1 MG EST has more turnover volume than the 2 MG tank. The 2 MG tank tends to remain full unless peak demands or fire flow conditions are modeled.
 - b. Under the master plan’s water demand forecasts for 2030 and 2050, the 1-MG tank appears to have better turnover volumes to maintain water quality. However, with the current pace of industrial development in the Stanton Springs area, the short-term water demands are continuing to evolve and may indicate the need for a larger tank.

4.00 RECOMMENDATIONS

Based on the evaluation results, either location is viable for the addition of the tank to provide additional resilience for the area and supply peak demands. A capacity of 1 MG currently provides better tank volume turnover in the model; however, a 2 MG tank may be warranted given the fast pace of development in the area.

Tank location considerations include:

1. Tank Height: Shire Parkway tank location has a lower ground elevation resulting in a taller tank height for the recommended overflow elevation. Taller tanks tend to have a higher construction cost.
2. Land Costs: the proximity to the I-20 interchange may be more expensive to purchase.
3. Piping Improvements: by 2050 additional piping improvements are recommended in the Stanton Springs area, with Shire Parkway tank location having approximately 3,000 feet of 12-inch pipe recommended versus an estimated 5,500 feet of 12-inch pipe for the I-20 Interchange tank.

Recommended parameters for each tank location are summarized in **Table 4**.

Table 4 – Recommended Tank Parameters

Parameter	Shire Parkway Tank Location	I-20 Interchange Tank Location
Tank Capacity	2 MG	2 MG
Overflow Elevation (feet)	890	895
Ground Elevation (feet)	723	772
Tank Height (feet)	167	123
Head Range (feet)	42	42
Tank Diameter (feet)	98	98
PRV Setting - 2030 (psi)	77	77

5.00 ADDITIONAL WATER DEMAND CONSIDERATIONS

Demonstrating the strong demand for industrial real estate in the Stanton Springs area, just as this study concluded, a new industrial customer, with the confidential name of “Project Terra” indicated an interest in

developing the area just across the I-20 interchange. This area is known as the East Atlanta mega-site. Project Terra indicates that its water demands will begin in 2022 and increase through 2024 as follows:

- Nov 2022: 0.22 MGD
- Feb 2023: 1.30 MGD
- May 2023: 2.80 MGD
- Aug 2023: 3.00 MGD
- Oct 2023: 3.50 MGD
- 2024: 4.30 MGD


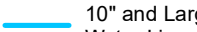

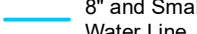


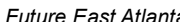






With the 2.8 MGD water demand anticipated by May 2023, Project Terra's demands can be met with the proposed improvements identified in this study, along with a proposed 16-inch to 24-inch water main extended along SR 278 from Stanton Road to the northeast quadrant of the I-20 interchange. Water pressure under maximum day conditions is approximately 35 psi with a 16-inch pipe across the I-20 interchange. Increased pipe capacity and localized storage are likely needed to provide pressure and flow rates required for fire demand conditions, which are not included in Project Terra's proposal.

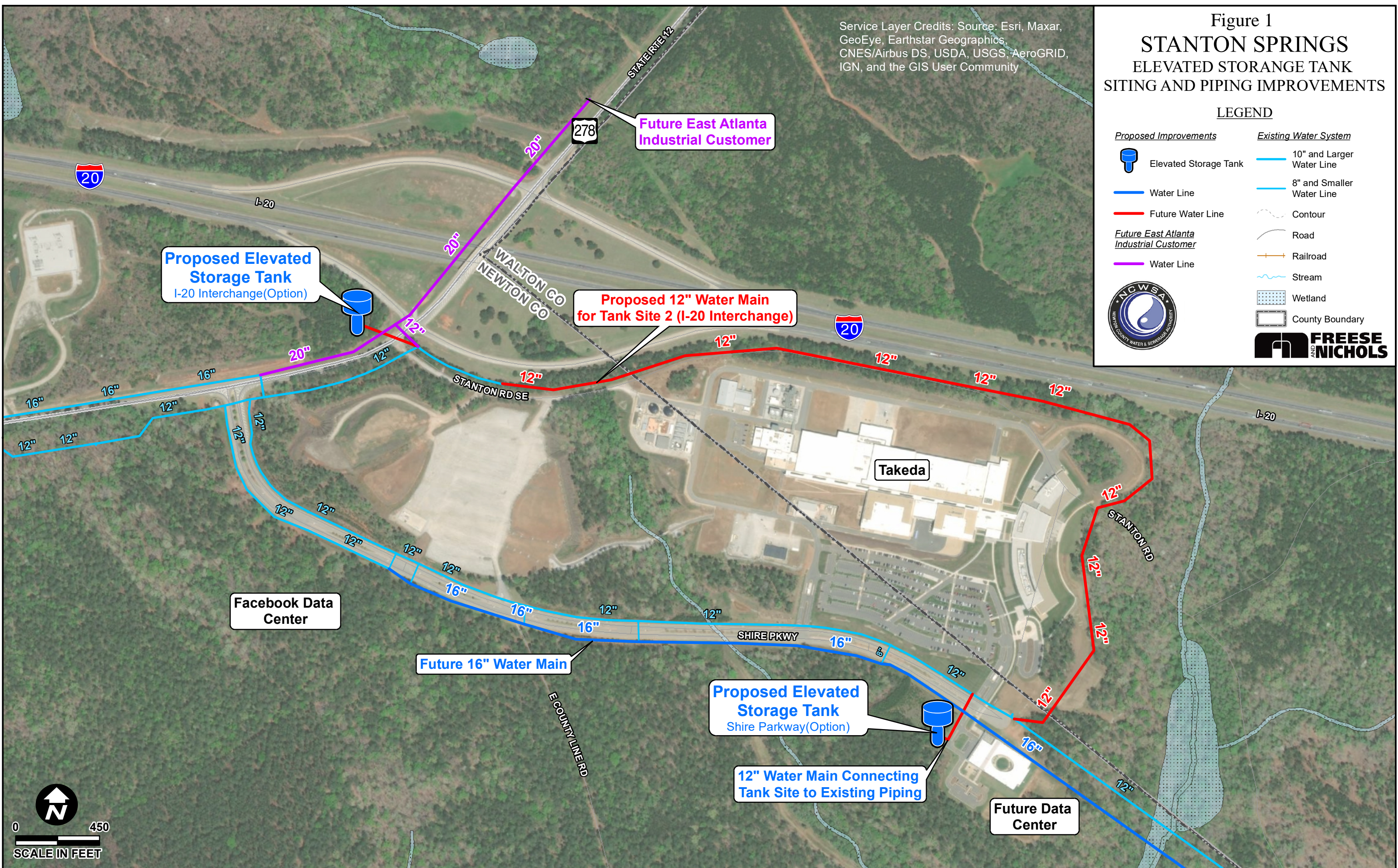
With the increased 2024 demand of 4.30 MGD specified by Project Terra, the model indicates the existing piping network from SR 11, Social Circle Road and along SR 278 will be stressed with velocities exceeding 5 fps. High headloss in the piping network results in reduced pressures in the Stanton Springs area, even with the proposed piping and storage improvements indicated in the previous sections. Additional storage up to 2 MG, located at the Project Terra building site or the proposed Shire Parkway tank location will be necessary, along with upgrades to the piping network along SR 278, Social Circle Road and SR 11 to provide the water supply within required performance criteria for pressure, velocity and headloss and continue to meet the industrial demands required by Facebook and Takeda.

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 1
STANTON SPRINGS
 ELEVATED STORAGE TANK
 SITING AND PIPING IMPROVEMENTS

LEGEND

Proposed Improvements		Existing Water System	
	Elevated Storage Tank		10" and Larger Water Line
	Water Line		8" and Smaller Water Line
	Future Water Line		Contour
	Future East Atlanta Industrial Customer Water Line		Road
			Railroad
			Stream
	NCWSA NEWTON COUNTY WATER & SEWERAGE AUTHORITY		Wetland
			County Boundary



Proposed Elevated Storage Tank
 I-20 Interchange (Option)

Future East Atlanta Industrial Customer

Proposed 12" Water Main for Tank Site 2 (I-20 Interchange)

Facebook Data Center

Future 16" Water Main

Proposed Elevated Storage Tank
 Shire Parkway (Option)

12" Water Main Connecting Tank Site to Existing Piping

Future Data Center

