



THE **UNDERGROUND** UTILITIES EVENT

Underground Construction Technology | Jan. 29-31, 2019 | Fort Worth, TX

# Reuse/Sanitary Sewer Extended Along Frisco, TX Commercial Corridor

Clayton C. Barnard, P.E.





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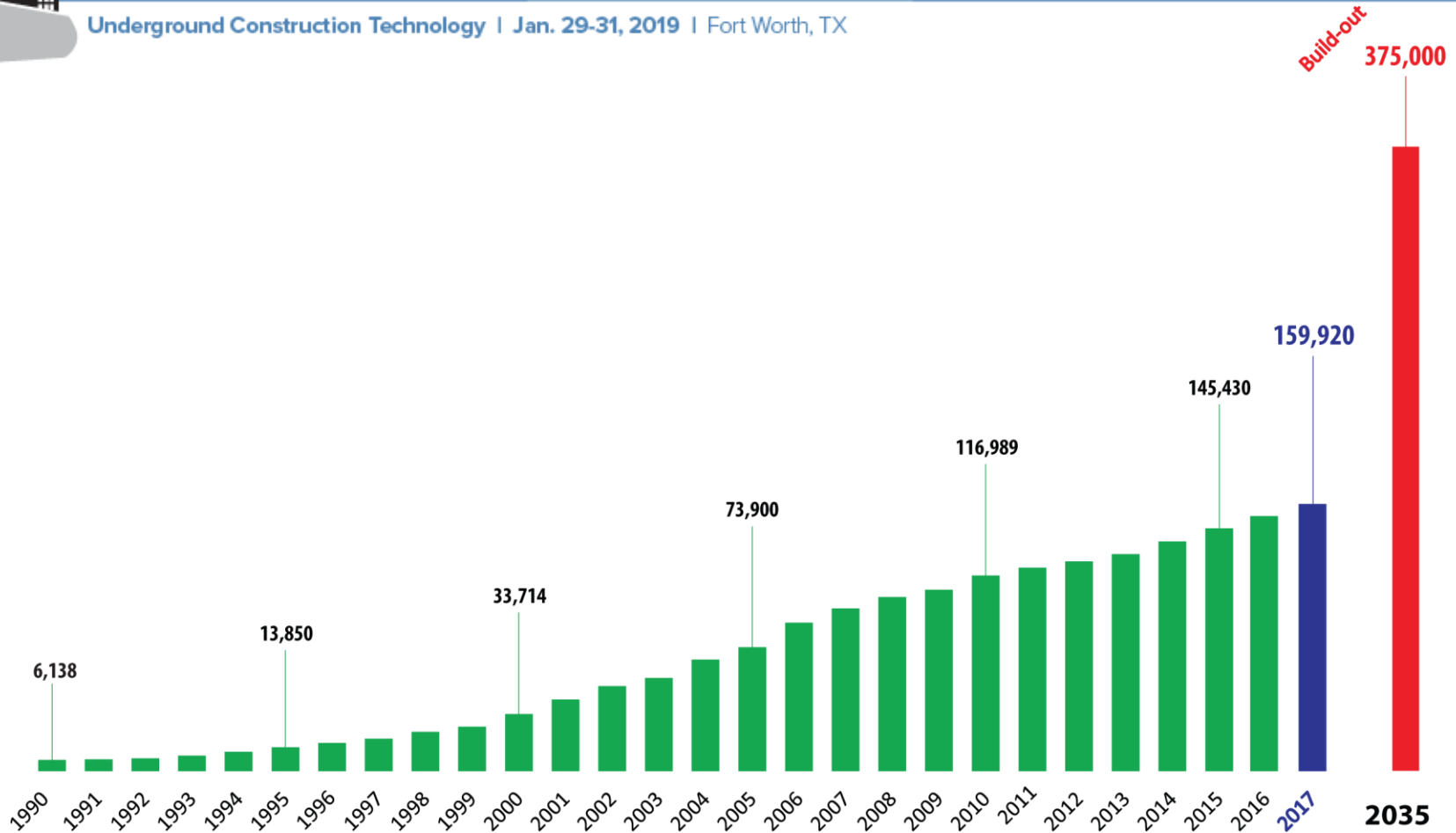
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# Project Location – Frisco, TX





# Demographics – Frisco, TX







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# Reuse System After Panther Creek

2009

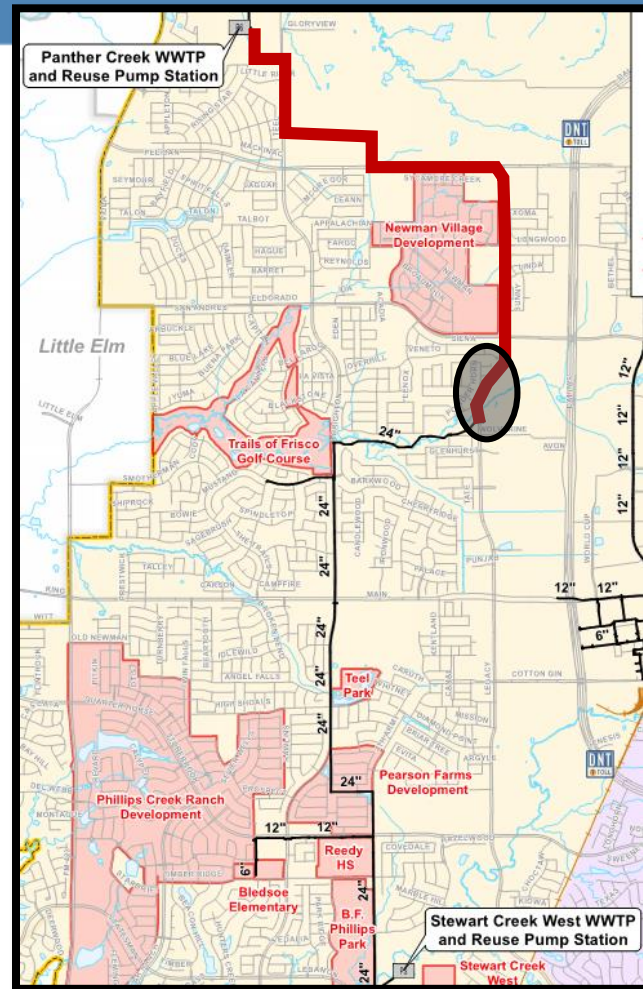
- Constructed Reuse P.S. at Panther Creek WWTP

2012

- B.F. Phillips Park connected to reuse system

2014

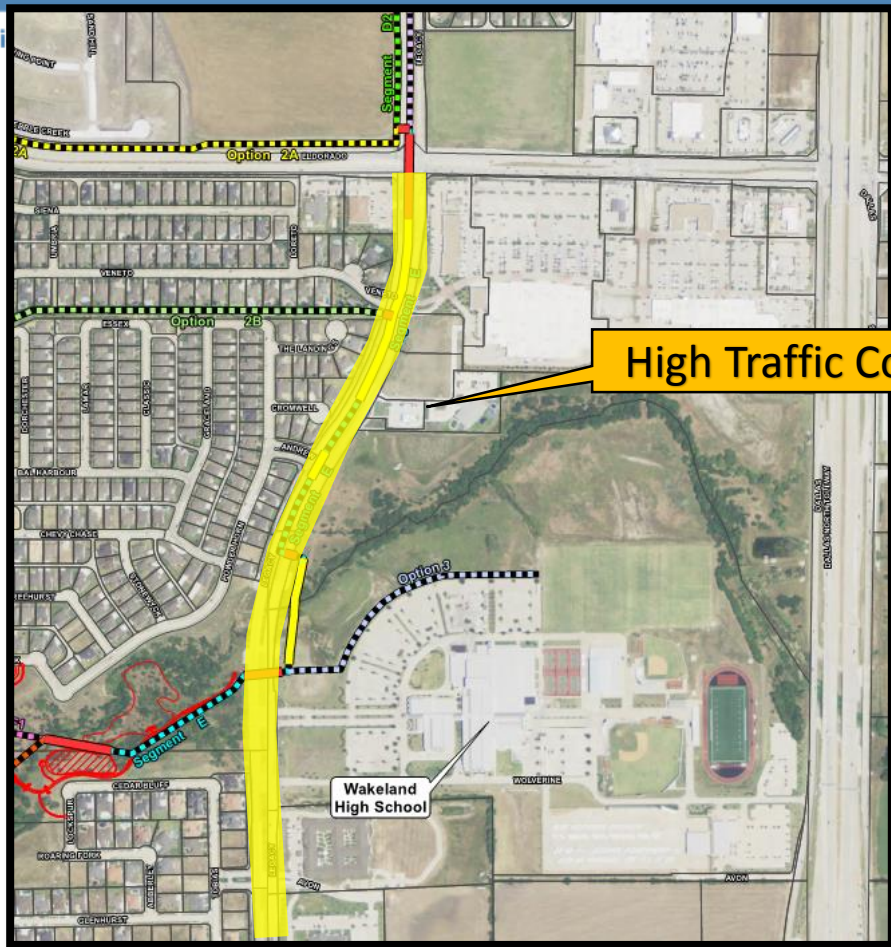
- Constructed Transmission Line from Panther Creek Reuse P.S. to System

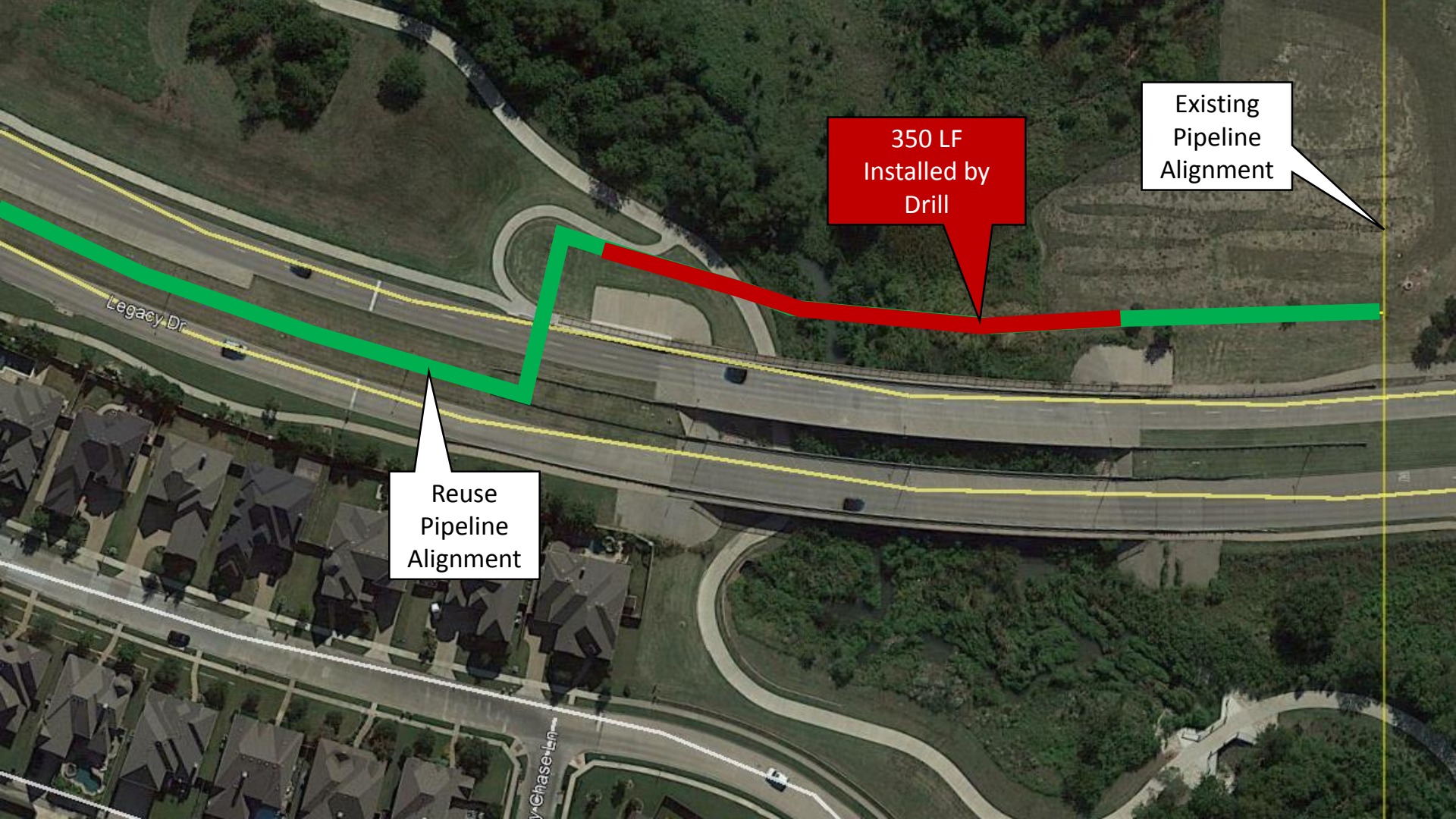




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Existing Pipeline Alignment

350 LF Installed by Drill

Reuse Pipeline Alignment

Legacy Dr

Chase Ln



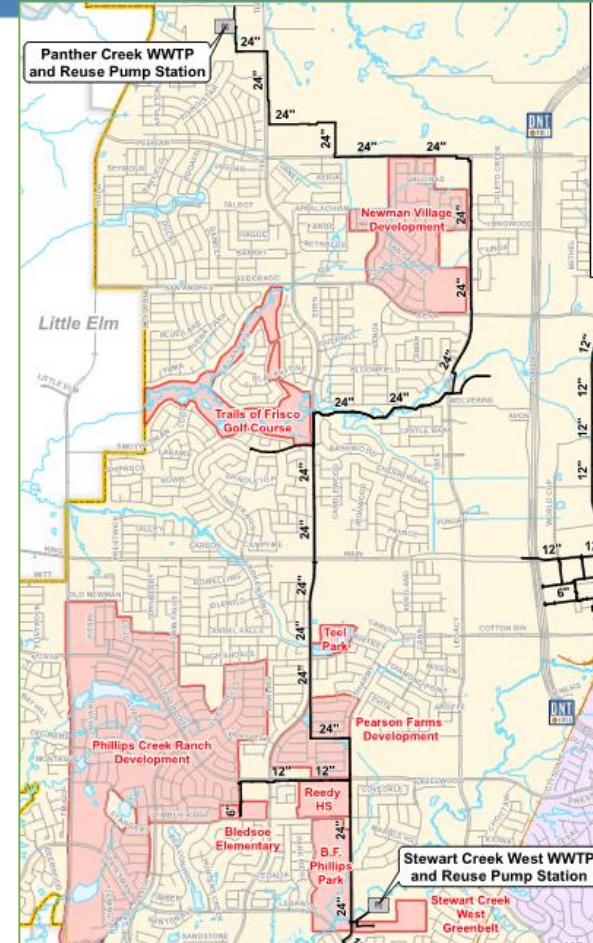
- 2 Pump Stations
- 10 Active Customers



Stewart Creek West WWTP



Panther Creek WWTP







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# North Platinum Corridor

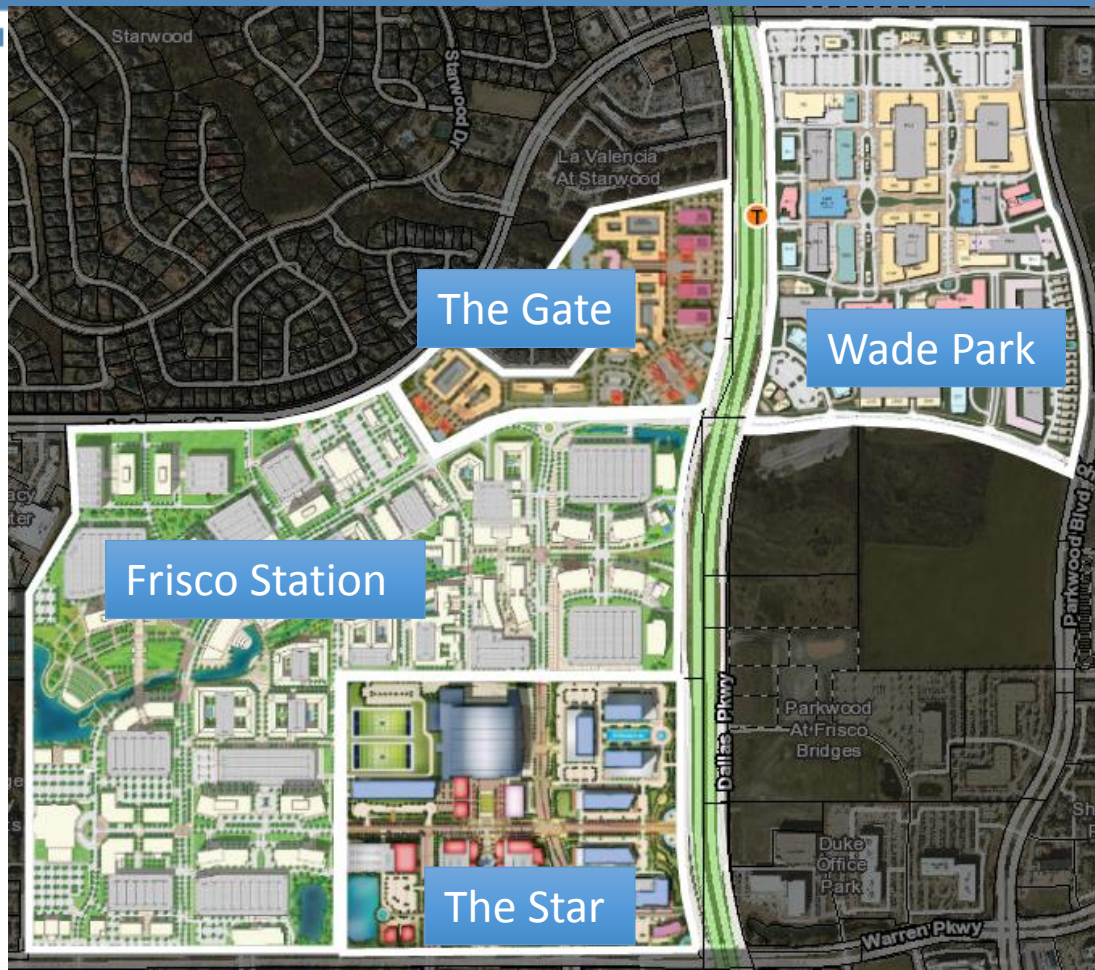


GenStar



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The Gate

Wade Park

Frisco Station

The Star

Stewart Creek  
West WWTP

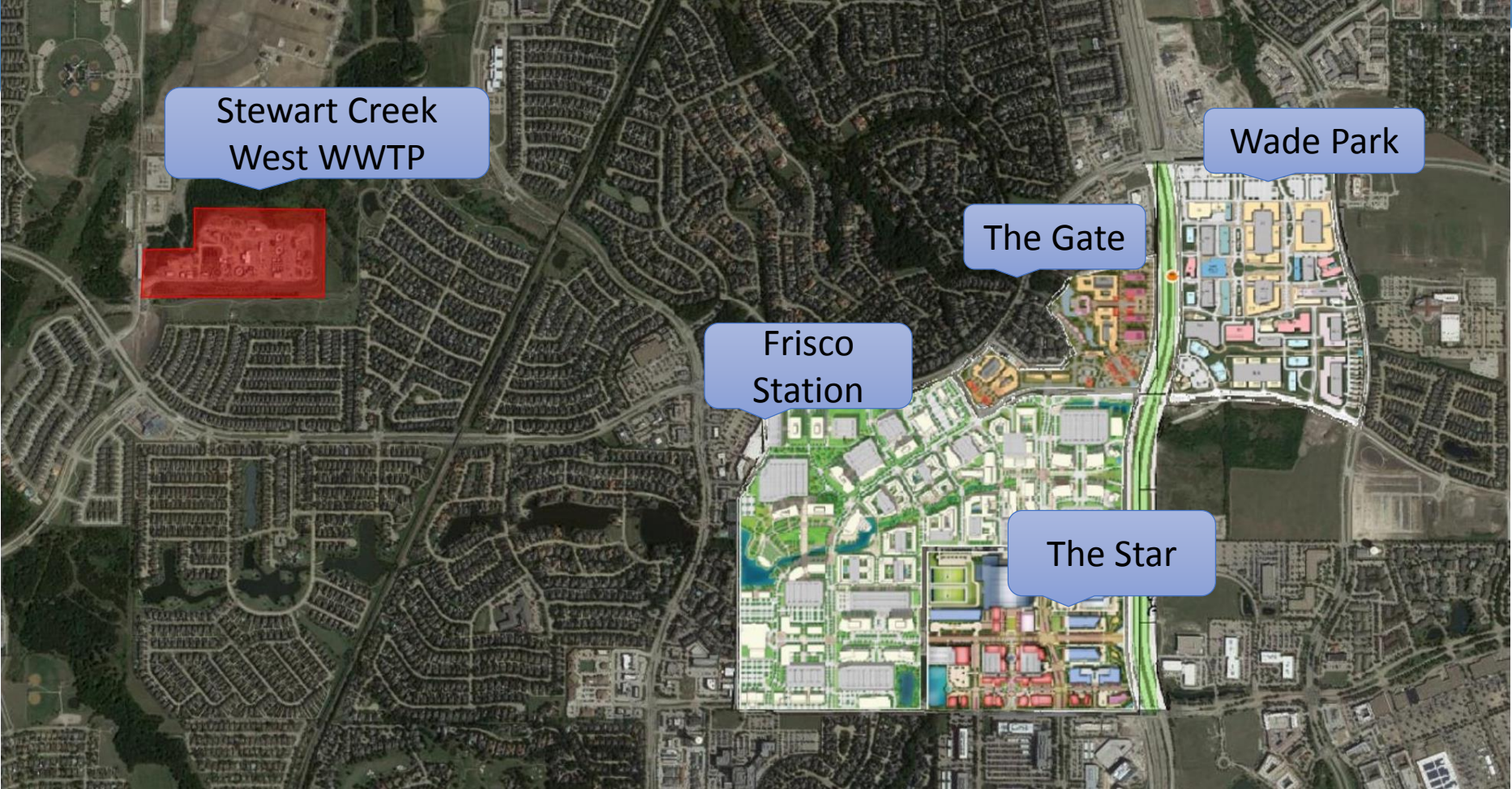


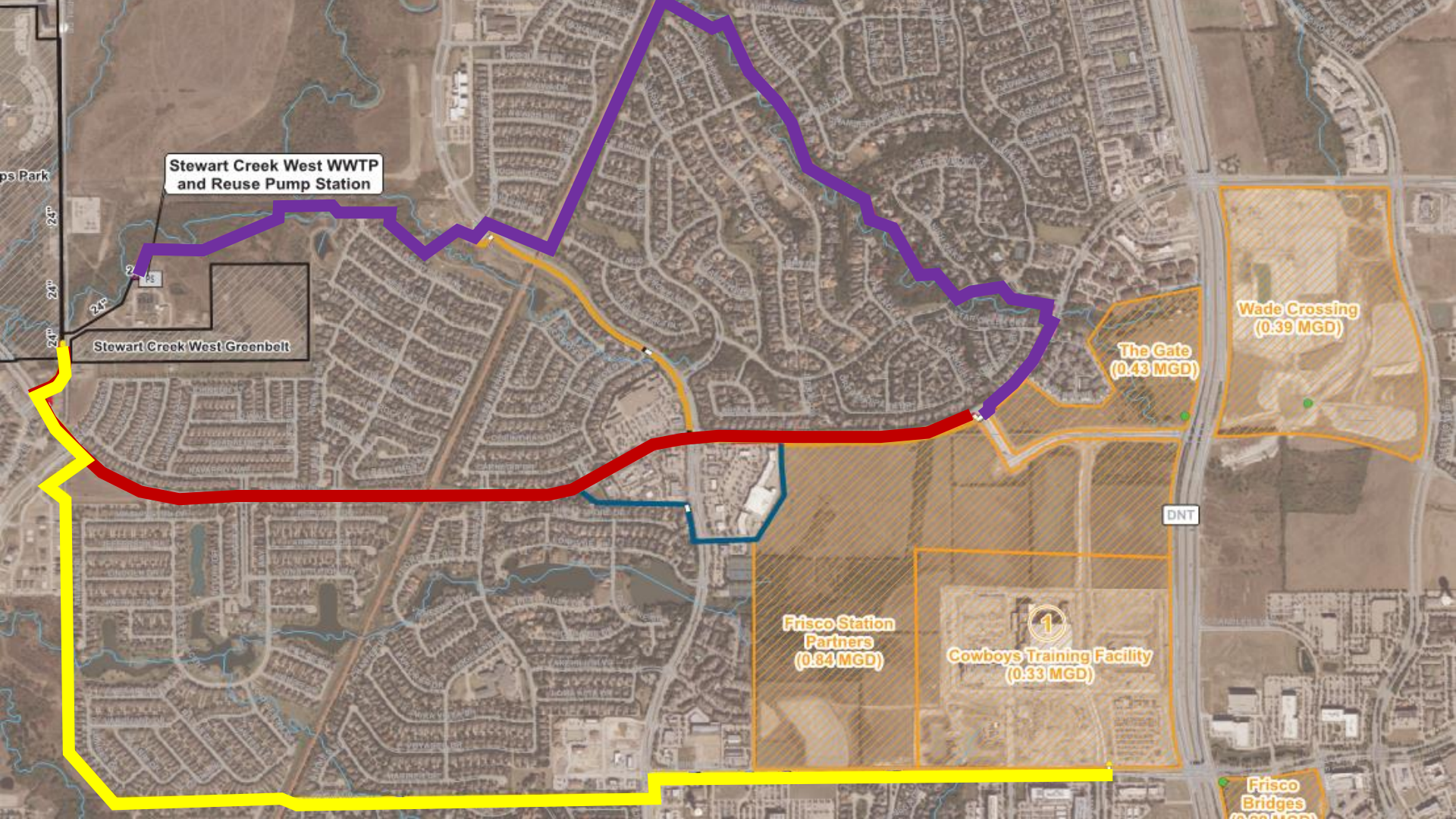
Wade Park

The Gate

Frisco  
Station

The Star





**Stewart Creek West WWTP  
and Reuse Pump Station**

**Stewart Creek West Greenbelt**

**The Gate  
(0.43 MGD)**

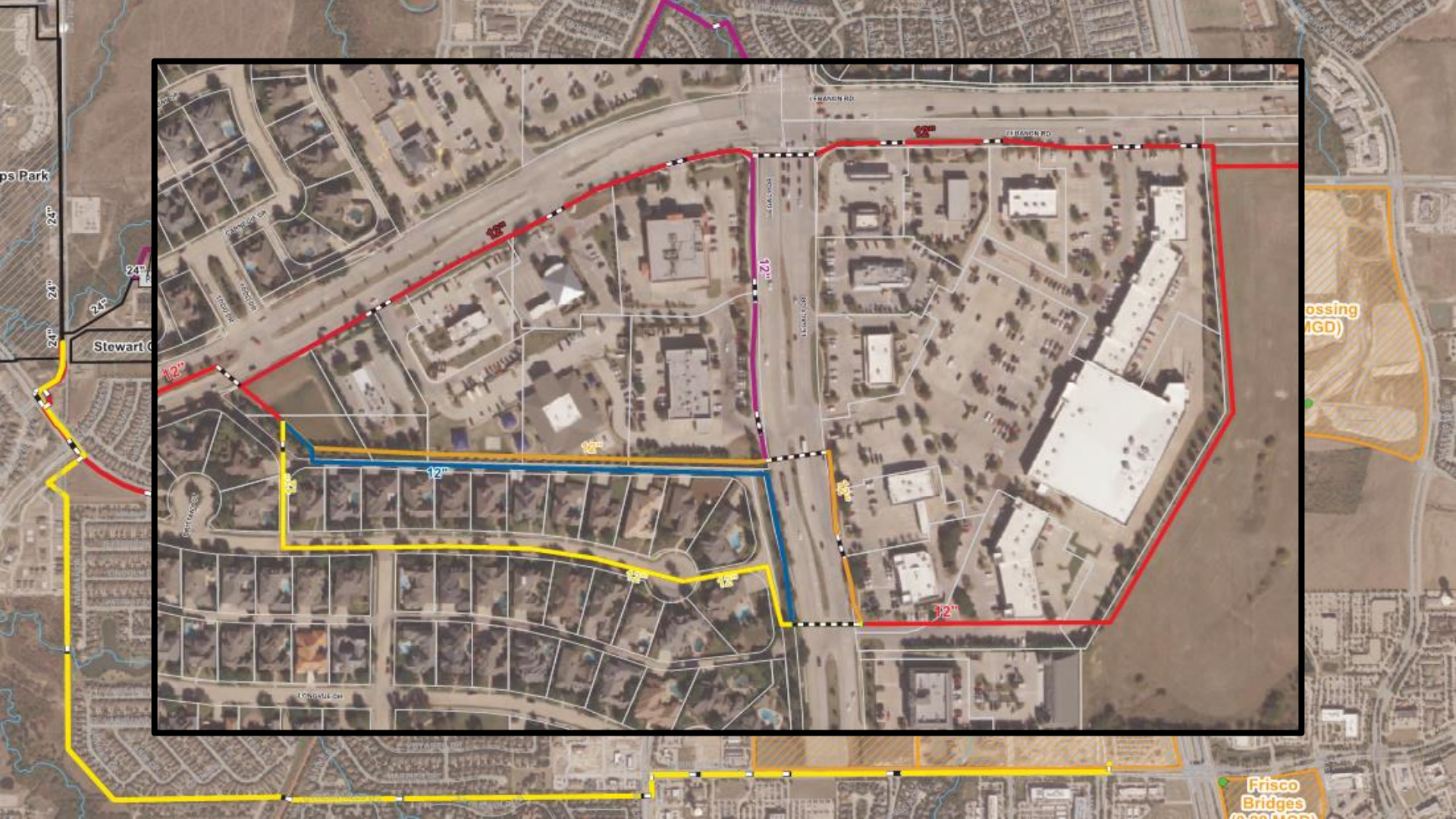
**Wade Crossing  
(0.39 MGD)**

**Frisco Station  
Partners  
(0.84 MGD)**

**1  
Cowboys Training Facility  
(0.33 MGD)**

**Frisco  
Bridges  
(0.07 MGD)**

DNT



ps Park

24"  
24"  
24"  
24"

Stewart C

12"

Entrance

1200 US HWY

WATERWORKS

FRASER RD

FRASER RD

12"  
12"  
12"  
12"

1200 US HWY

12"

12"

12"

12"

12"

Crossing  
(GD)

Frisco  
Bridges  
2024



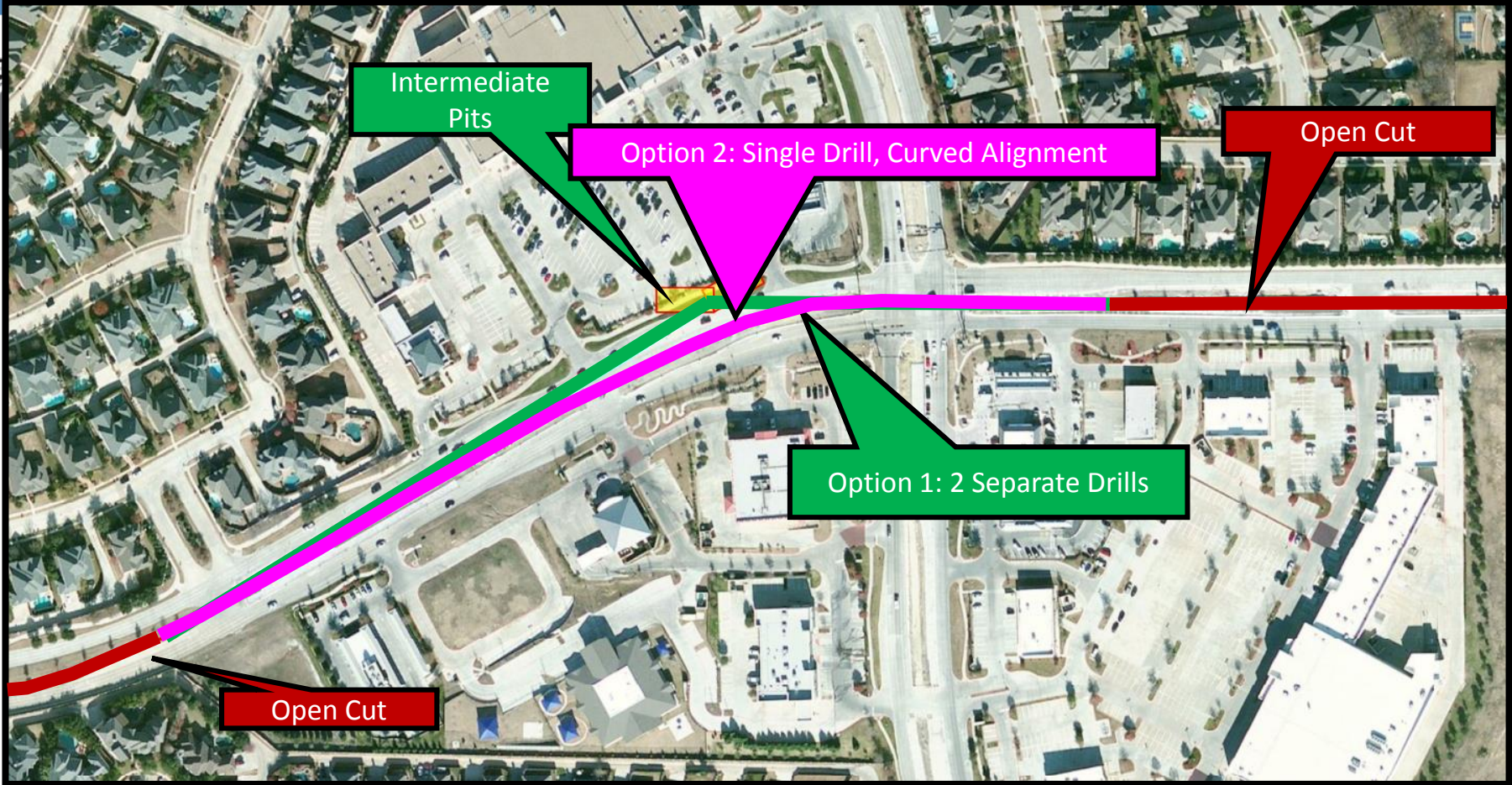
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Intermediate  
Pits

Option 2: Single Drill, Curved Alignment

Open Cut

Option 1: 2 Separate Drills

Open Cut





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# Horizontal Directional Drill





Nominal Depth, feet bgs		General Description	Detailed Description of Soils/Materials Encountered
Top of Layer	Bottom of Layer		
<b>B-01</b>			
0	20	Fat Clay Lean Clay	Stiff to hard, Fat Clay with Sand (CH) / Lean Clay with Sand (CL) / Fat Clay (CH).
20	30	Weathered Shale	Soft, Weathered Shale.
<b>B-02</b>			
0	1	Fill	Hard, Clayey Sand (SC) / Sandy Lean Clay (CL) Fill.
1	5	Weathered Limestone	Soft to hard, Weathered Limestone.
5	13	Limestone	Very hard, Limestone.
13	45	Shale	Soft, Shale.
<b>B-03</b>			
0	2	Fat Clay	Very stiff, Fat Clay with Sand (CH).
2	7	Weathered Limestone	Hard, Weathered Limestone.
7	30	Limestone	Very hard, Limestone.



- Advertised Date: July 2015
- Estimated Project Cost: \$3 million
- Bid Date: July 28, 2015
  - 3 bids were received
- FPVCP was sole sourced for the HDD

Bid Item	Description	Quantity	Unit
<b>A. Reuse Water Line</b>			
15	Jack, Bore, or Tunnel (Steel Casing)(20")	1,079	LF
16	Reuse Water Line – 12" DR18 PVC (Horizontal Directional Drill)	2,451	LF



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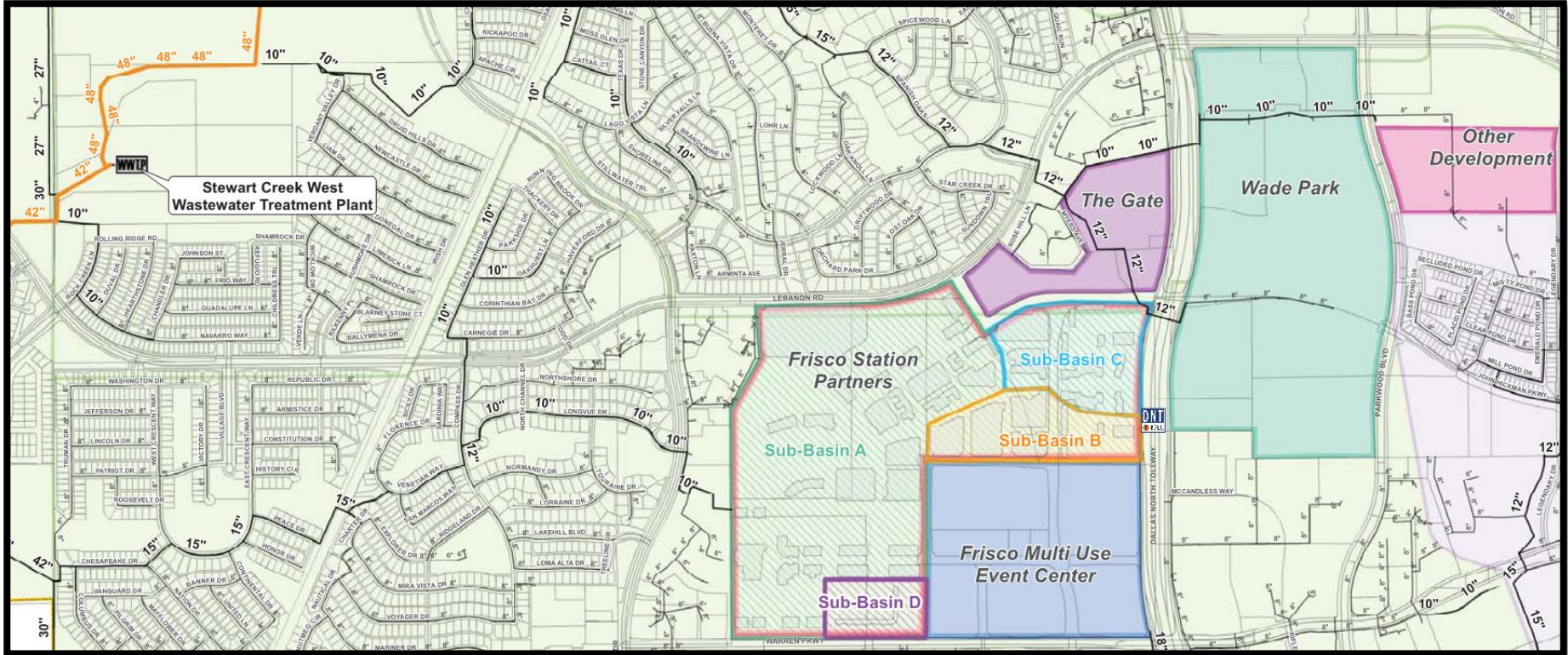
# Construction - Reuse





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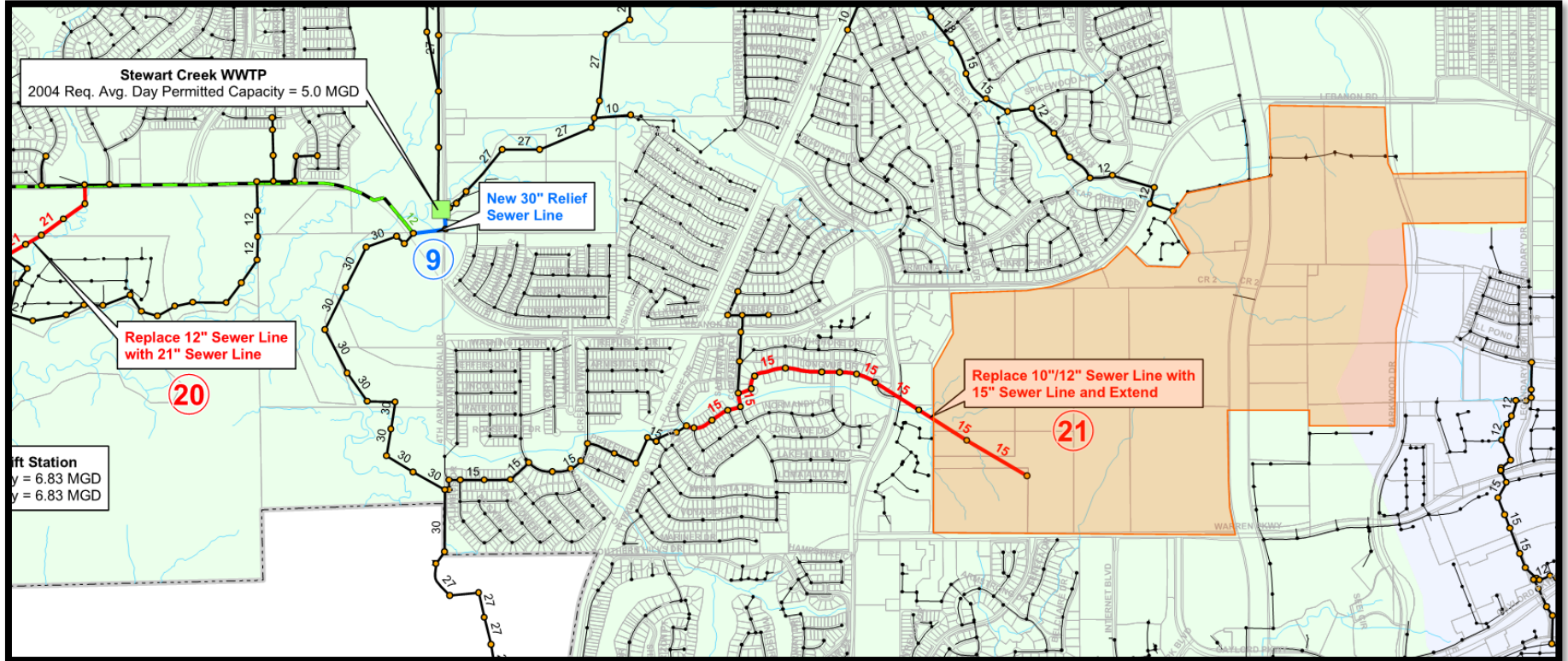
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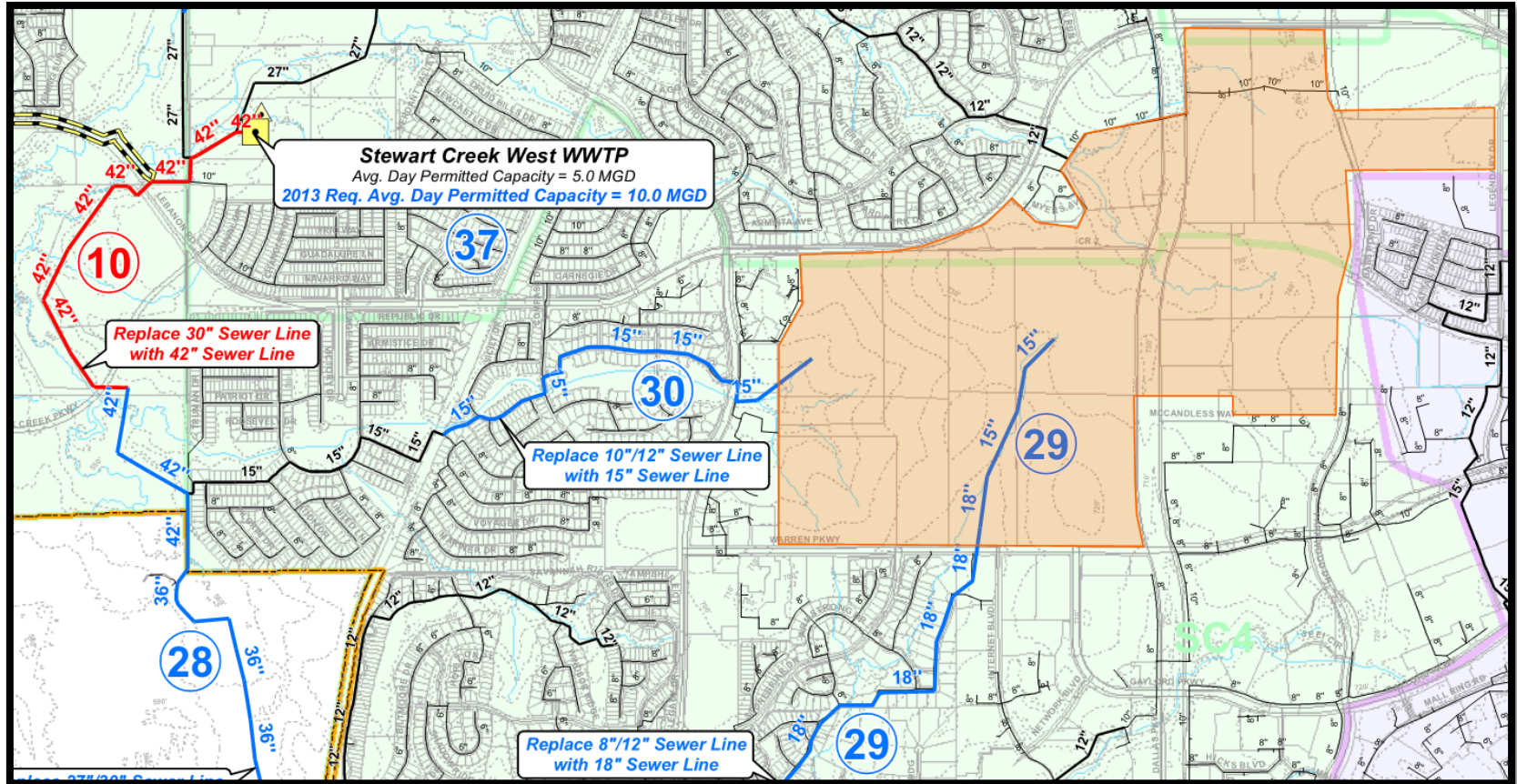
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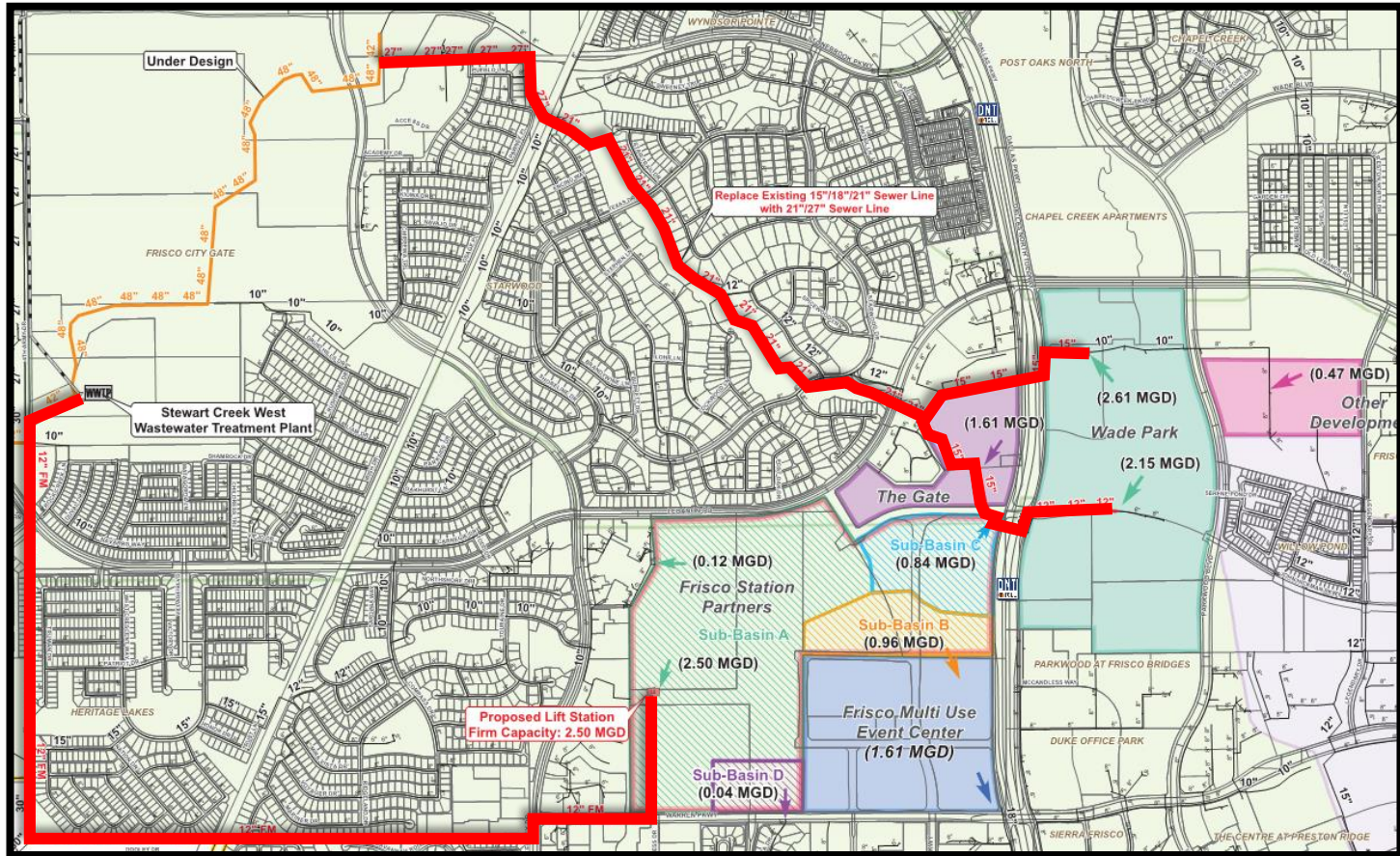
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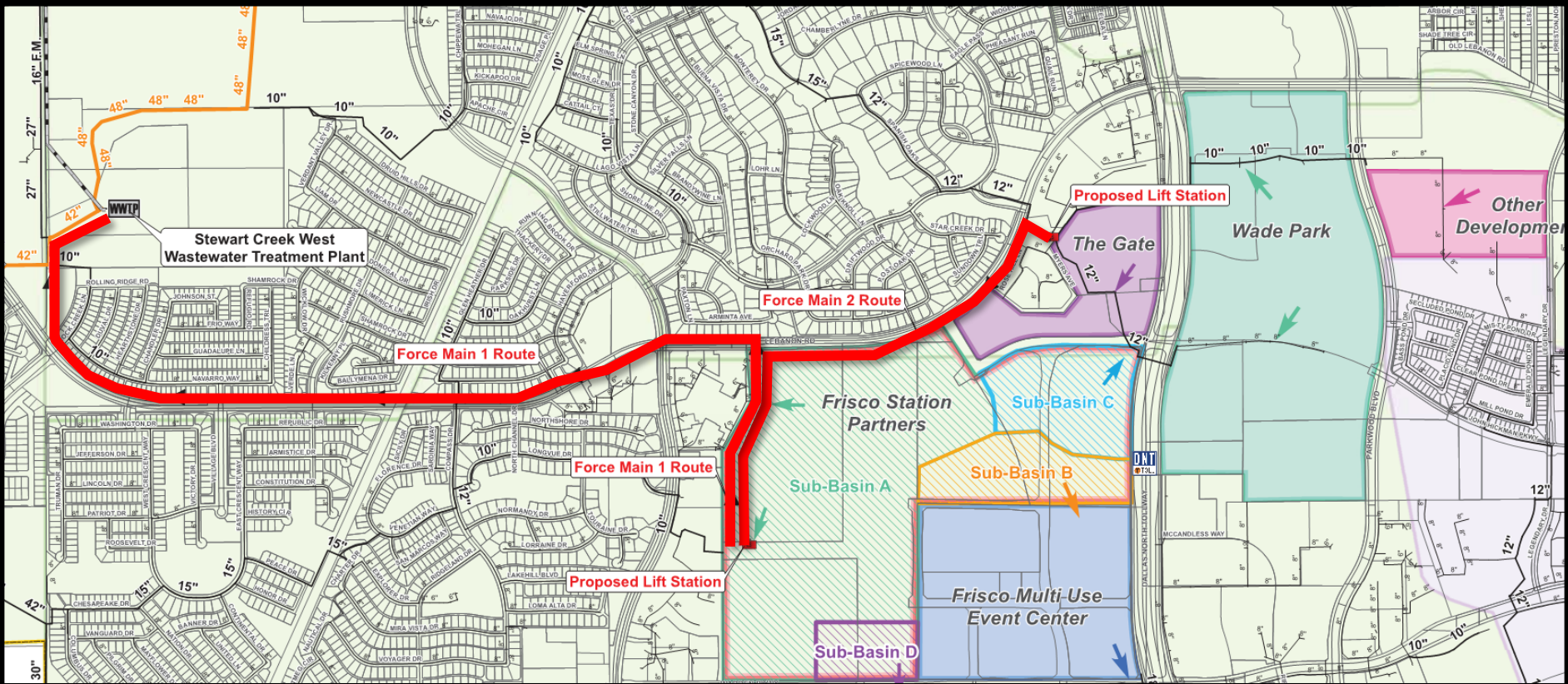






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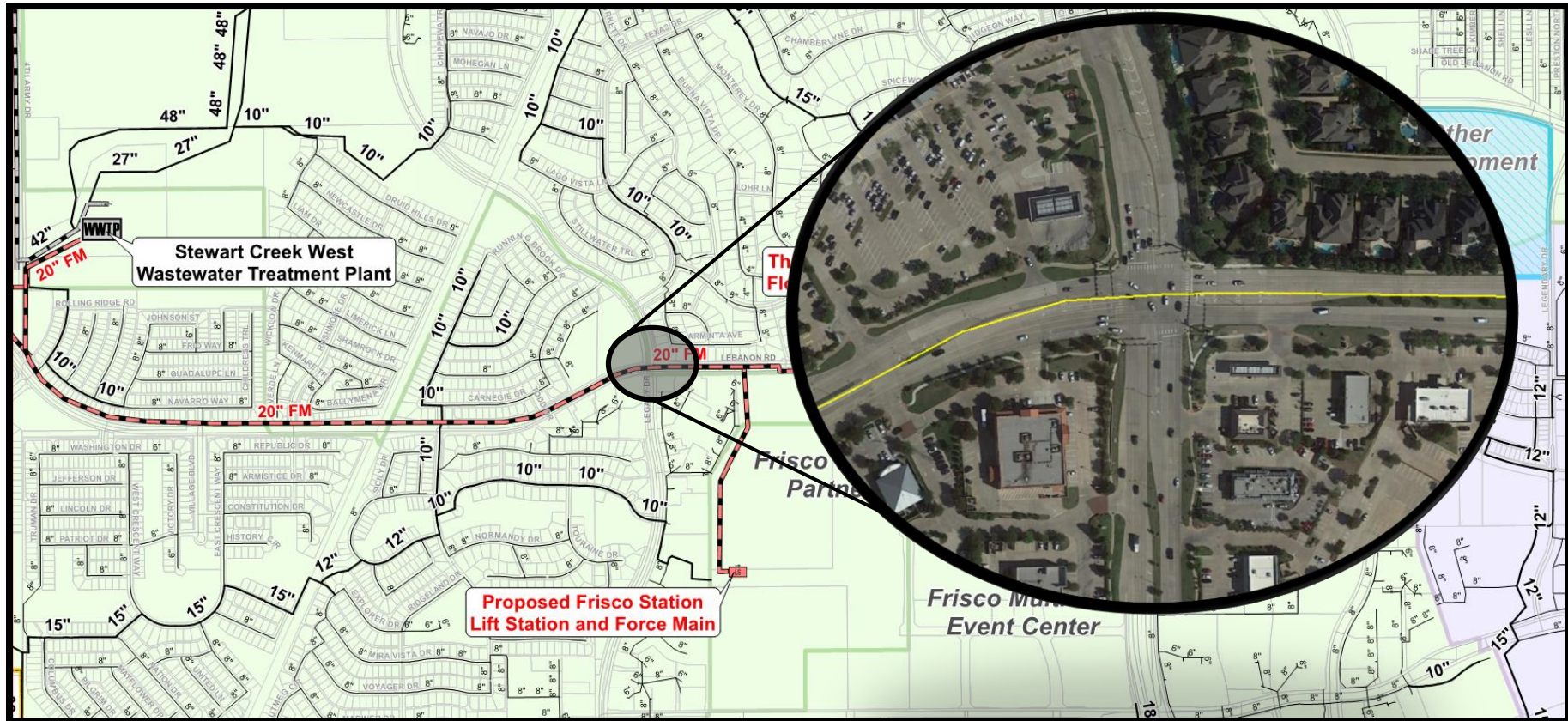






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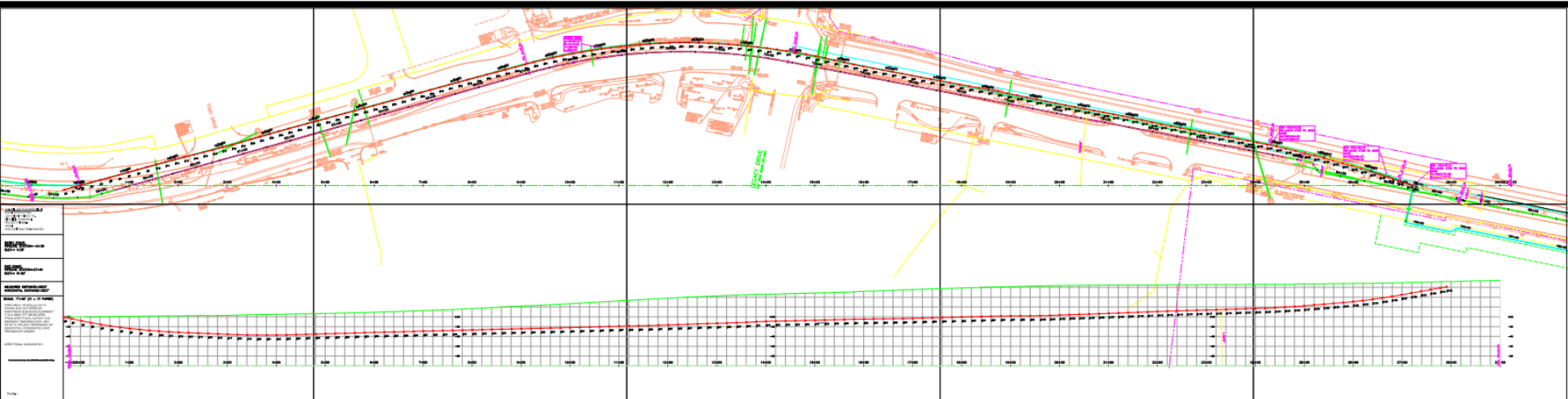


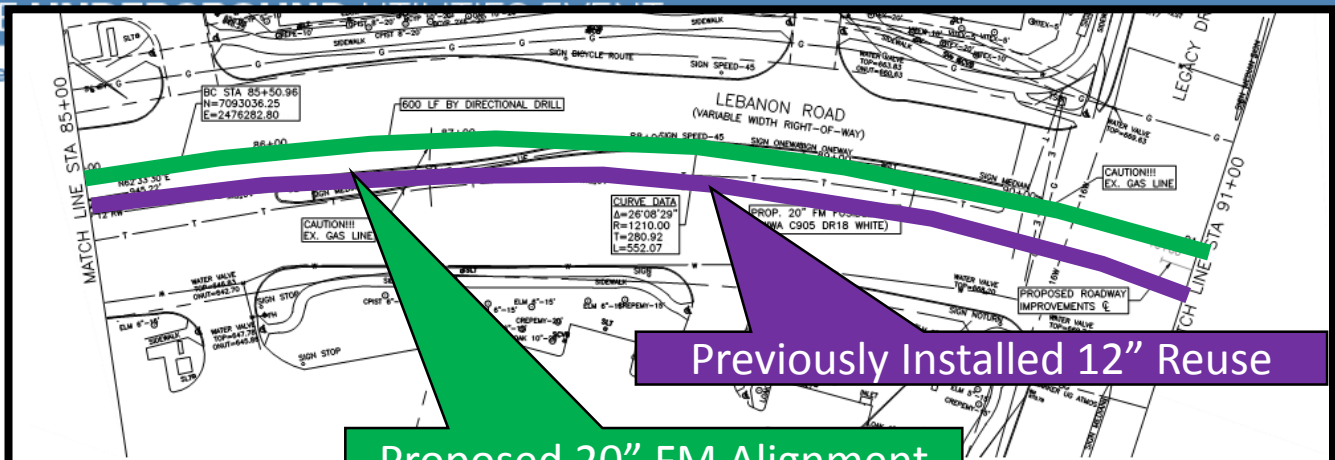


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# Horizontal Directional Drill Force Main

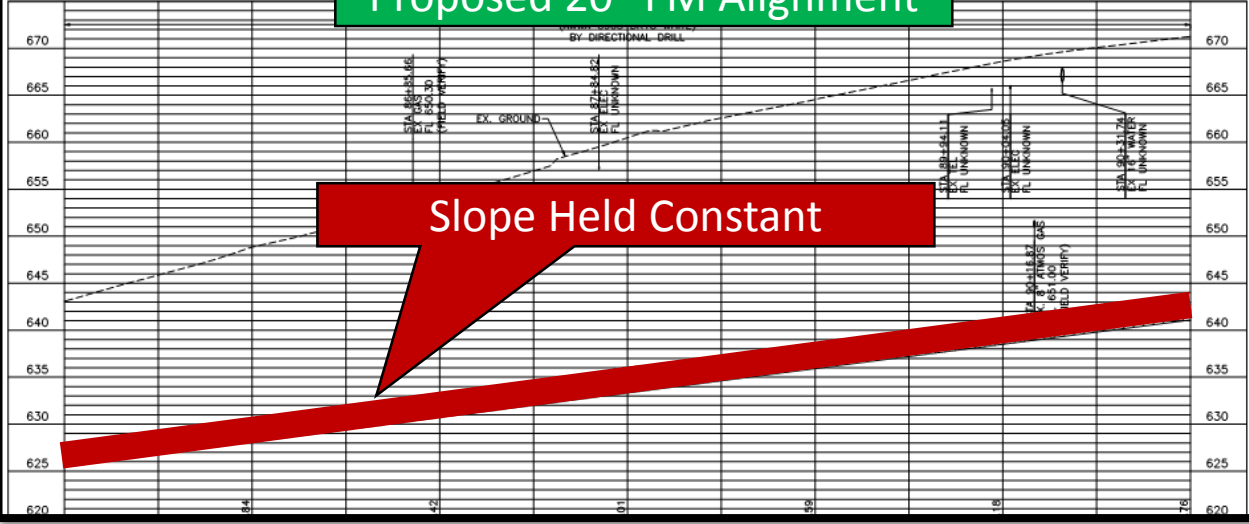
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Previously Installed 12" Reuse

Proposed 20" FM Alignment



Slope Held Constant



- Advertised Date: May 2017
- Estimated Project Cost: \$8 million
- Bid Date: June 12, 2017
  - 5 bids were received
- FPVCP was sole sourced for the HDD

Bid Item	Description	Quantity	Unit
<b>B. Force Main</b>			
2	Jack, Bore, or Tunnel (Steel Casing)(36")	2,238	LF
3	Force Main – Fusible PVC (DR 18)(20")(Horizontal Directional Drill)	2,637	LF



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# Construction- Force Main

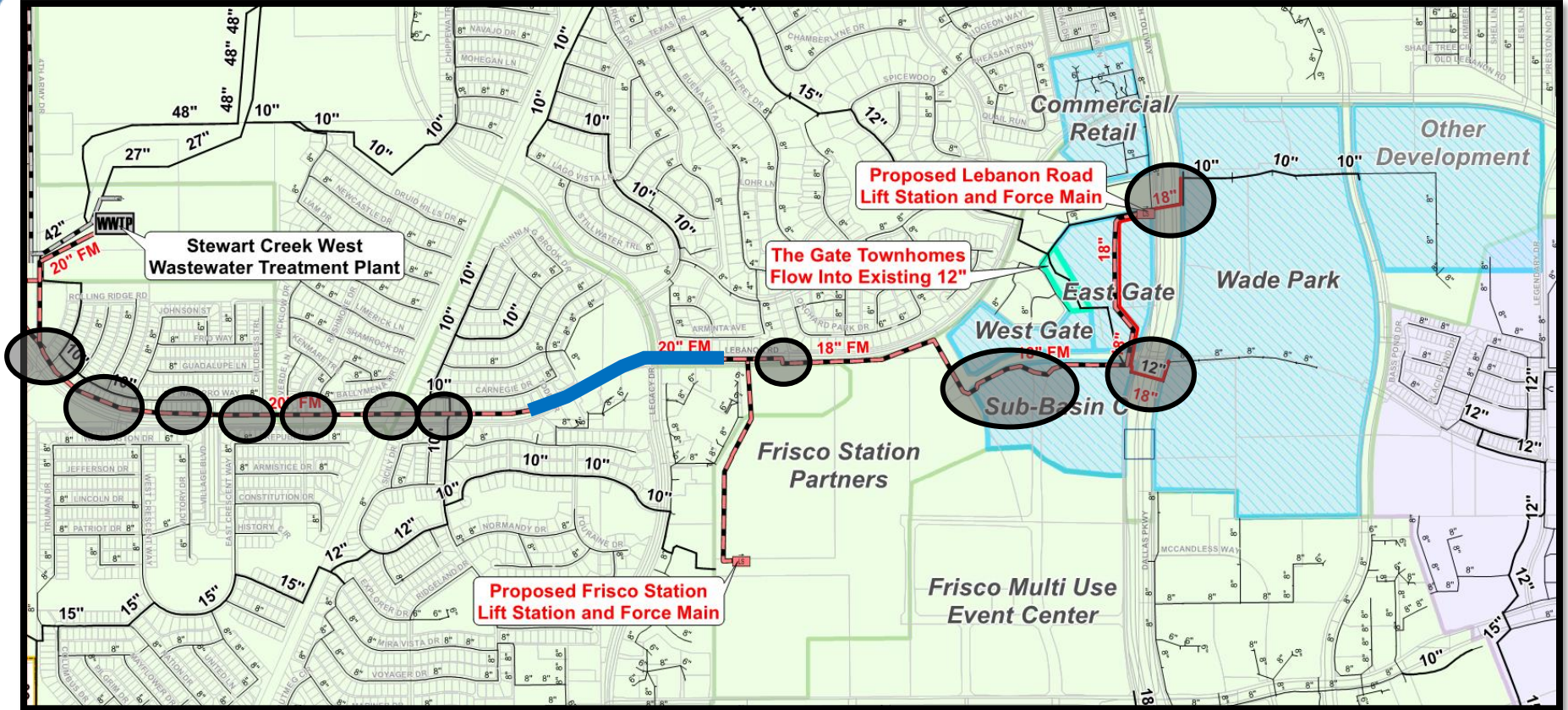






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# Construction- Force Main





- ~2,500 LF Reuse HDD in 1 pull
  - Pipe was fused in one length
- ~2,700 LF SSFM HDD in 1 pull
  - Two intermediates were required
- Minimal traffic control
  - Brief 1-lane shutdowns for material and equipment drop-offs
- Challenge:
  - Curvilinear alignment on the SSFM HDD



- Trenchless installation minimized disruption to the surface feature
- Suitable soil condition and availability of sufficient working area contributed to the success of the project
- HDD proved to be a time and cost efficient method
- Drilling through rock formation yielded extremely stable bore hole



## THANK YOU

- Art Hartle, PE
  - [ahartle@friscotexas.gov](mailto:ahartle@friscotexas.gov)
- Clayton C. Barnard, PE
  - [Clayton.barnard@freese.com](mailto:Clayton.barnard@freese.com)

