

May 2, 2023

Kim Foutz
Director of Development Services
City of Marble Falls
801 W 4th Street
Marble Falls, Texas 78654

delivered via email to kfoutz@marblefallstx.gov

Re: Water & Wastewater Assessment (WA-223) Version 2
City of Marble Falls, Texas
Black Jack Marble 56, Jackson Road, Full-Purpose Jurisdiction

Dear Ms. Foutz,

Miller Gray (MG) has reviewed the water and wastewater submittal documents for a development known as "Black Jack Marble 56" (BJ56), which is located east of Jackson Road and south of Panther Hollow Drive in the Full-Purpose Jurisdiction of the City of Marble Falls. The City tasked MG with preparing a water and wastewater assessment of the area for general conformance with City and State Codes and to verify impacts to the water and wastewater systems. Please see below for further description of the project assessment results.

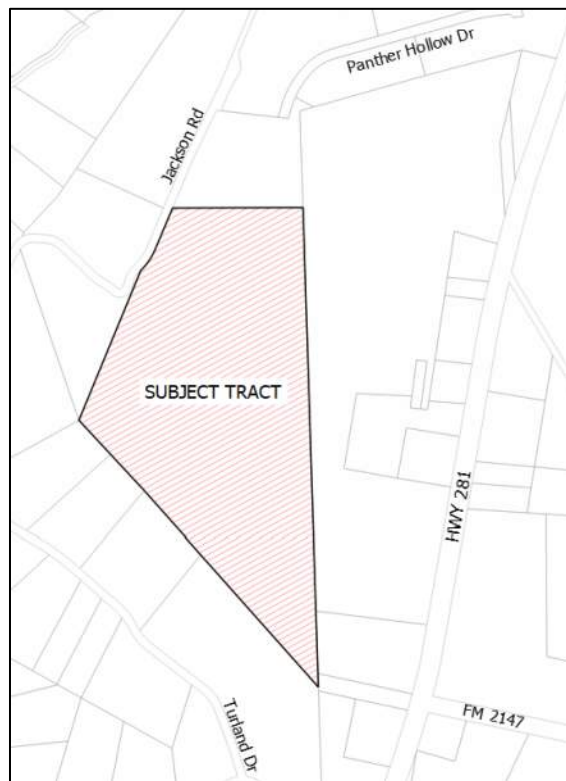


Figure 1 – Location Map

1. Background Information

The water and wastewater assessment for the BJ56 development utilizes applicant supplied information with the documents listed below included as attachments.

- Attachment A – Service Request Form
- Attachment B – Land Survey
- Attachment C – Conceptual Land Plan

2. Project Details

The estimated number of LUEs within the BJ56 development classified by type of use are summarized below.

- Condo/Apartment Unit Low Density: 327.6 LUEs (468 units @ 0.7 LUE per unit)
- Office/Amenity for Low Density: 2.5 LUEs (assumed for typical Condo/Apartment)
- Condo/Apartment Unit High Density: 207.5 LUEs (415 units @ 0.5 LUE per unit)
- Office/Amenity for High Density: 2.5 LUEs (assumed for typical Condo/Apartment)
- Total LUEs: 540 LUEs on 57.00 acres

The range of existing ground elevations within the limits of the BJ56 development are as follows:

- Lowest Ground Elevation: ~860 feet
- Highest Ground Elevation: ~965 feet

3. Water Assessment

The BJ56 development does not currently receive water service and requires connections to the nearest available water system with adequate pressure, flow, and storage. MG prepared an estimate of water demand along with an evaluation of water supply and associated impacts as noted below. A map showing the subject tract along with the existing water system is shown in Attachment D – Water Service Area Map.

3.1 Existing Pressure Planes & Storage

The City has two existing pressure planes that could potentially serve the BJ56 development. A summary of the pressure planes and their associated Hydraulic Grade Lines (HGLs) are outlined below.

Gateway Park Pressure Plane

The Gateway Park Pressure Plane (GP-PP) is served by the Gateway Park Booster Pump Station (GP-BPS) and the Gateway Park Standpipe (GP-SP).

- Existing system with a typical HGL of 1,020 ft.
- Serves ground elevations 736 ft. to 932 ft.
- Rated pumping capacity of 500 gpm per TCEQ §290.45.
- Rated pumping capacity of 833 LUEs (at 0.6 gpm/LUE).

The existing GP-SP has an elevated storage volume of 47,500 gallons with all storage capacity allocated to existing customers as noted below.

- Existing Storage Capacity: 47,500 gallons (elevated)
- Existing Storage Capacity: 237 LUEs (storage rate of 200 gal/LUE)

Flatrock Pressure Plane

The Flatrock Pressure Plane (FL-PP) is served by the Flatrock Booster Pump Station (FL-BPS) and the Flatrock Elevated Storage Tank (FL-EST).

- Existing system with a typical HGL of 1,271 ft.
- Serves ground elevations 932 ft. to 1,187 ft.
- Rated pumping capacity of 750 gpm per TCEQ §290.45.
- Rated pumping capacity of 1,250 LUEs (at 0.6 gpm/LUE).

The existing FL-EST has an elevated storage volume of 1,000,000 gallons with all storage capacity allocated to existing customers as noted below.

- Existing Storage Capacity: 1,000,000 gallons (elevated)
- Existing Storage Capacity: 5,000 LUEs (storage rate of 200 gal/LUE)

3.2 Existing Distribution System

The BJ56 development is required to be supplied by FL-PP and the associated 16 inch Flatrock Transmission Main along the western side of US 281 between Panther Hollow Drive and Rocky Road.

The FL-PP pressures in this area require Pressure Reducing Valves (PRVs) which create a reduced zone in the vicinity of the BJ56 development. The reduced zone has not yet been established; however, it is proposed to be created by a series of three PRVs with one installed by the Little Panther Apartments development (City Assessment WA-220) and two installed by the Roper West development (City Assessment WA-205).

The three PRVs are expected to connect to the Flatrock Transmission Main and supply the existing 12 inch South Water Main as shown in Attachment D. The characteristics of the reduced zone are as follows:

- Proposed system with a typical HGL of 1,065 ft.
- Serves ground elevations 755 ft. to 985 ft.

3.3 Project Water Demand

The consumer water demand for the BJ56 development is estimated as noted below along with a calculation provided in Attachment E – Water Demand Calculations.

Total Project

- ADD: 113.4 gpm / 0.16 mgd (average daily demand, calculated)
- PDD: 226.8 gpm / 0.33 mgd (peak day demand, calculated)
- PHD: 302.4 gpm / 0.44 mgd (peak hour demand, calculated)
- FFD: 1,500.0 gpm / 2.16 mgd (fire flow demand, assumed)
- EMD: 1,726.8 gpm / 2.49 mgd (emergency demand, calculated)

3.4 Project Water Storage

The water system is required to provide a total storage volume of 200 gal/LUE per TCEQ 290.45(b)(2)(E) and a minimum elevated storage volume of 100 gal/LUE per TCEQ 290.45(b)(2)(G).

- LUEs: 540
- Min. Elevated Storage: 54,000 gallons
- Total Storage: 108,000 gallons
- All storage volumes for the GP-PP and FL-PP are allocated to existing users.

3.5 Project Water Pumping

MG evaluated the FL-BPS pumping capacity to determine the ability to serve the BJ56 development. The evaluation assumes that all storage will be elevated, resulting in the requirement of: "For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required at each pump station or pressure plane" per TCEQ 290.45(b)(2)(F). A summary of pumping requirements is outlined below.

- Total pumping requirement for the BJ56 development is an additional 324 gpm of rated capacity serving 540 LUEs.

3.5 Project Water Main Connections

MG evaluated new water main connections to the proposed FL-PP reduced zone and considered water piping improvements necessary to serve the BJ56 development. The evaluation considered primary connections to the existing 12 inch mains serving the Roper West development as shown on Attachment D.

3.6 Project Water Pressures

MG evaluated peak hour demand (PHD) and emergency demand (EMD) impacts to the affected water systems and calculated pressures expected within the project. The minimum allowable pressures at all points within the distribution network are 35 psi for PHD and 20 psi for EMD, per TCEQ §290.44(d). All analyses assume that minimum storage is provided in the FL-PP and utilizes the reduced zone typical HGL.

- PHD– MG calculated PHD pressures for the supply scenario described above ranging from 43 psi to 88 psi at all model junctions within the BJ56 development.
- EMD – MG calculated EMD total available flows with no residual pressures of less than 20 psi.

3.7 Water Summary & Recommendations

Recommendations for improvements to the water system based on impacts from the BJ56 development are outlined as follows:

Part I: Piping Connections

- The Applicant shall provide a minimum of two 12 inch connections to the existing 12 inch mains as shown on Attachment D.
- The Applicant shall route the 12 inch mains into the development and internally loop.
- The Applicant shall acquire any necessary easements to connect to the Flatrock Transmission main.

Part II: Pumping Improvements

- MG recommends the installation of new pumping capacity to serve the GP-PP with a preliminary cost of \$1,500,000 and rated capacity of 5,000 gpm (\$300/gpm).
- MG recommends that the Applicant contribute their pro-rata share of the upgraded pumping cost totaling \$90,600 (302 gpm @ \$300/gpm).

Part III: Elevated Storage Improvements

- MG recommends the installation of additional storage capacity to serve the area near BJ56, and the City is currently evaluating a new Elevated Storage Tank with a preliminary cost of \$5,000,000 and storage volume of 1,000,000 gallons (\$5/gal).
- MG recommends that the Applicant contribute their pro-rata share of the upgraded storage cost totaling \$540,000 (108,000 gal @ \$5/gal).

4. Wastewater Assessment

The BJ56 development does not currently receive wastewater service and requires connections to the nearest available system with adequate capacity. MG prepared an estimate of wastewater demand along with an evaluation of wastewater capacity and associated impacts as noted below.

A map showing the subject tract along with the existing wastewater system is shown in Attachment F – Wastewater Service Area Map. Please note that this assessment does not comprehensively examine wastewater availability in the system for the areas north of Lake Marble Falls.

4.1 Existing Gravity Wastewater System

The City has two wastewater collection systems currently in service near the development. A general description of the two gravity mains is provided below.

Panther Hollow Gravity Main

- The Panther Hollow Gravity Main (PHGM) consists of a 8 inch PVC gravity main, approximately 813 linear feet long, with a downstream limit at the Panther Hollow Lift Station and an upstream limit near the southern terminus of Panther Hollow Drive.
- The PHGM generally has a total capacity of 573 gpm and maximum allowable capacity of 487 gpm when considering that PWWF shall be limited to 85% of total capacity; however, slope conditions restrict capacity at two bottlenecks along the pipe. The PHGM bottlenecks and capacities are described as follows:

Bottleneck No. 1

- Bottleneck No. 1 occurs between Stations 0+00 and 0+20 where the pipe flattens in slope for a distance of 20 linear feet restricting flow to a total capacity of 352.7 gpm.
- Bottleneck No. 1 causes this portion of the main to have a *maximum allowable capacity of 299.8 gpm*.

Bottleneck No. 2

- Bottleneck No. 2 occurs between Stations 3+12 and 4+37 where the pipe flattens in slope for a distance of 125 linear feet restricting flow to a total capacity of 286.4 gpm.
- Bottleneck No. 2 causes this portion of the main to have a *maximum allowable capacity of 243.4 gpm*.

Existing Development & Capacity

- Existing (and recently authorized) development served by the PHGM is estimated to consume *157.6 gpm of capacity*.

Rocky Road Gravity Main

- The Rocky Road Gravity Main (RRGM) consists of varied diameter PVC gravity main (6 and 8 inch), approximately 2,111 linear feet long, with a downstream limit at the Panther Hollow Lift Station and an upstream limit at WorldMark Resort Marble Falls.
- The 8 inch portion of the RRGM near the PHLS generally has a total capacity of 352.8 gpm and maximum allowable capacity of 299.9 gpm when considering that PWWF shall be limited to 85% of total capacity.
- Existing development served by the RRGM is estimated to consume *22.4 gpm of capacity*.

4.2 Existing Lift Station System

The PHGM and RRGM flow into the existing Panther Hollow Lift Station as noted above. The characteristics of the lift station are as follows:

Existing Panther Hollow Lift Station

- Well Diameter = 9 ft.
- Well Material = Fiberglass
- Well Depth = 15 ft. (lid to invert)
- Pump Quantity = 2 (duplex pump configuration)
- Pump Capacity = 197 gpm (firm pumping capacity)
- Force Main Diameter = 4 in. PVC
- Force Main Velocity = 5.0 fps
- Force Main Pressure = 108 psi

4.3 Project Wastewater Demand

The consumer wastewater demand for the BJ56 development is estimated using Applicant supplied LUEs and land uses. A summary of wastewater demand is noted below along with a wastewater demand calculation shown in Attachment G.

- ADWF: 90.2 gpm / 0.13 mgd (average dry weather flow)
- PDWF: 225.2 gpm / 0.32 mgd (peak dry weather flow)
- I&I: 29.7 gpm / 0.04 mgd (inflow & infiltration)
- PWWF: 255.1 gpm / 0.37 mgd (peak wet weather flow)

4.4 Project Wastewater Connections

The wastewater assessment evaluated connecting to the RRGGM given the capacity restrictions on the PHGM and determined the following:

Gravity Main Piping Connection

- The RRGGM has a maximum allowable capacity of 299.9 gpm.
- Existing development served by the RRGGM is estimated to consume 22.4 gpm of capacity.
- The RRGGM can accommodate all 540 LUEs (251.6 gpm) as noted above.

Upgraded Panther Hollow Lift Station

The Panther Hollow Lift Station requires upgrades to serve the BJ56 development and must consider flows from existing and recently proposed adjacent developments. The upgraded lift station will need to convey the following Peak Wet Weather Flows at a minimum:

- Existing: 197.0 gpm
- Adj. Developments: 301.4 gpm
- BJ56: 251.6 gpm
- Total: 750.0 gpm

Upgraded Panther Hollow Force Main

The Panther Hollow Force Main requires upgrades to serve the BJ56 development and must consider flows from existing and recently proposed adjacent developments. The upgraded force main will need to convey the Peak Wet Weather Flows noted above.

- The Panther Hollow Lift Station requires a 12 inch force main when accounting for the Peak Wet Weather Flows noted above.

4.5 Wastewater Recommendations

Recommendations for improvements to the wastewater system based on the impacts from the BJ56 development are outlined below and on the annotated System Map shown in Attachment F.

Piping Connections

- The Applicant shall connect to the existing 8 inch RRGGM at an existing manhole and acquire any necessary easements.
- The proposed BJ56 main shall be an 8 inch gravity main and dedicated to the public.

Lift Station

- MG recommends the installation of new pumping capacity at the Panther Hollow Lift Station, with a rated pumping capacity of 750 gpm at a preliminary cost of \$450,000 (\$600/gpm).
- MG recommends that the Applicant contribute their pro-rata share of the new pumping capacity cost totaling \$150,960 (251.6 gpm @ \$600/gpm).

Force Main

- MG recommends the installation of a new 12 inch force main for a distance of ~2,070 linear feet with a capacity of 750 gpm to serve the upgraded Panther Hollow Lift Station, at a preliminary cost of \$414,000 (\$552/gpm).
- MG recommends that the Applicant contribute their pro-rata share of the new force main capacity cost totaling \$138,883 (251.6 gpm @ \$552/gpm).

Please review this summary letter and should you have any questions, please feel free to contact our office.

Sincerely,

MillerGRAY

TBPE Firm Reg. No. F-16302



Samuel C. Shorter, P.E.
Senior Engineer

Cc: Dale Gray, P.E. – Miller Gray



- Attachment A: Service Request Form
- Attachment B: Land Survey
- Attachment C: Conceptual Plan
- Attachment D: Water Service Area Map
- Attachment E: Water Demand Summary
- Attachment F: Wastewater Service Area Map
- Attachment G: Wastewater Demand Summary



City of Marble Falls – Water & Wastewater Service Request

Part I – Overview

1. The Water & Wastewater Service Request form is intended for developments of four (4) or more living unit equivalents (LUEs) or as prescribed by the City of Marble Falls.
2. The Applicant shall provide all necessary information to assess water & wastewater service, and is made aware that additional information may be required as part of the request.
3. At a minimum, the Applicant shall supply a basic plan (i.e., Conceptual, Land, or Preliminary Plan) showing existing water & wastewater utility lines along with all proposed lines and connections (including pipe sizes and materials).
4. For multi-building developments other than single-family residential, the Applicant shall provide square footage and usage type for each building.
5. The Applicant may attach additional sheets information if necessary.

Part II – Background Information

| | |
|-------------------------|---------------------------------|
| Project Name | Black Jack Marble 56 |
| Site Address(es) | Jackson Rd |
| Tax Parcel ID Number(s) | 119649 |
| Current Legal Owner | Black Jack Marble Falls 58, LLC |
| Total Land Area (acres) | 57 |

Part III – Service Needs

| | |
|-----------------------------------|-----|
| Request for Water (y/n) | Y |
| Request for Wastewater (y/n) | Y |
| Request for Reclaimed Water (y/n) | N |
| Request for Fire Flow (y/n) | Y |
| Lowest Land Elevation Served | 860 |
| Highest Land Elevation Served | 965 |

Part IV – Plan Information

| | |
|--|---------|
| Basic Plan Attached (y/n?) | Y |
| Plan Type (Conceptual, Land, | Concept |
| Detailed Plan Attached (y/n?) | N |
| Plan Type (Site, Construction, Utility?) | |

Attachment A - Service Request Form

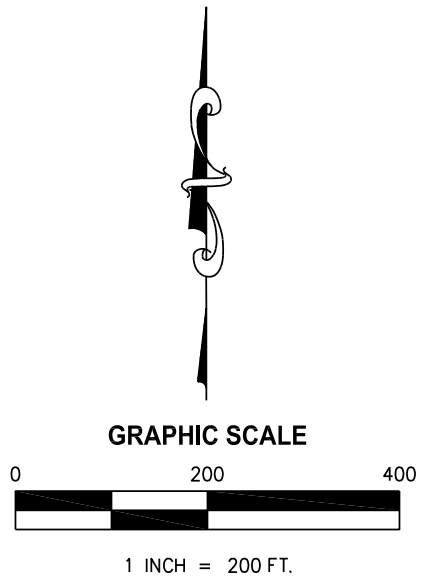


Part V – Land Use Information

| | | |
|---|-----|----------------------|
| Single Family Residence, Modular Home, Mobile Home | | (number of units) |
| Duplex | | (number of duplexes) |
| Triplex, Fourplex | | (number of units) |
| Condo / Apartment Unit (less than 24 units/ac) | 468 | (number of units) |
| Condo / Apartment Unit (24 units/ac or greater) | 415 | (number of units) |
| Hotel or Motel Room | | (number of rooms) |
| Office | | (total square feet) |
| Warehouse | | (total square feet) |
| Retail, Shopping Center | | (total square feet) |
| Restaurant, Cafeteria | | (total square feet) |
| Hospital | | (number of beds) |
| Rest Home | | (number of beds) |
| Church (Worship services only) | | (number of seats) |
| High School / Middle School (incl. Gym & Cafeteria) | | (number of students) |
| Elementary School (incl. Gym & Cafeteria) | | (number of students) |
| Other (Specify _____) | | (number of _____) |

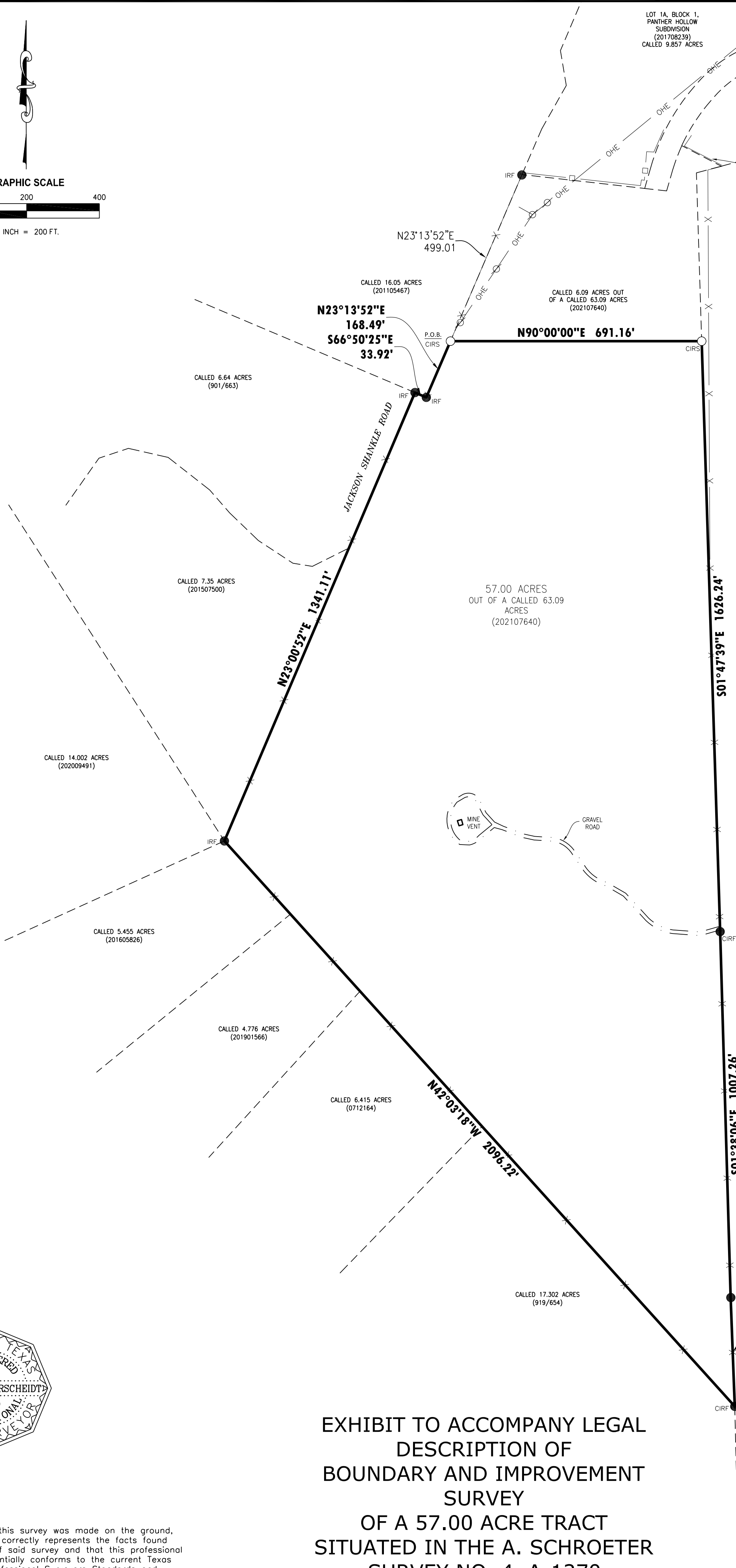
*****END*****

Attachment B - Land Survey



LEGEND / ABBREVIATIONS

| | |
|-----|-----------------------|
| --- | ADJOINER LINE |
| --- | BOUNDARY LINE |
| --- | GRAVEL |
| X | WIRE FENCE |
| --- | WROUGHT IRON FENCE |
| OHE | OVERHEAD ELEC LINE |
| ● | IRON ROD FOUND |
| ○ | CAPPED IRON ROD SET |
| ⊙ | POWER POLE |
| ⊗ | IRON ROD FOUND |
| ⊙ | CAPPED IRON ROD FOUND |
| ⊗ | CAPPED IRON ROD SET |



GENERAL NOTES

1. The surveyor has not abstracted the site. This survey was performed without benefit of title commitment and does not show all easements and encumbrances of record.
2. Bearing based on Texas State Plane Coordinates, Central Zone, 4203, NAD83-US Survey feet, derived from GPS observations.
3. All 'CIRS' are 5/8-inch iron rod with plastic cap stamped "Landpoint" unless otherwise noted.
4. This original work is protected under copyright laws, Title 17 United States Code Sections 101 and 102. All violators will be prosecuted to the fullest extent of the law. This survey is being provided solely for the use of the recipients named and no license has been created, express or implied, to copy the survey except as is necessary in conjunction with the original transaction, which shall take place within thirty (30) days from the date adjacent to the signature line herein.

LEGAL DESCRIPTION

Being 57.00 acres situated in the A. Schroeter Survey No. 4, A-1270 & the Guadalupe Flores Survey No. 7, A-304, Burnet County, Texas, being out of a called 63.09 acres described in Document Number 202107640, Official Public Records of Burnet County, Texas and being more particularly described by metes and bounds as follows:

BEGINNING at a 1/2 inch iron rod with plastic surveyor's cap stamped "landpoint" set in the east line of a called 16.05 acres described in Document No. 201105467, Official Public Records of Burnet County, Texas, for the Southwest corner of a called 6.09 acres out of a said 63.09 acres, & for the Northwest corner of this tract, from which a 1/2 inch iron rod found in the east line of said 16.05 acres, at the southwest corner of Lot 1A, Block A, Panther Hollow Subdivision, recorded in Document No. 201708239, Official Public Records of Burnet County, Texas, & at the Northwest corner of said 6.09 acres out of said 63.09 acres, bears N 23°13'52" E, a distance of 499.01 feet;

Thence, with the South line of said 6.09 acres out of said 63.09 acres, N 00°00'00" E, a distance of 400.44 feet to a 1/2 inch iron rod with plastic surveyor's cap stamped "landpoint" set in the West line of a called 68.89 acres described in Volume 1153, Page 358, Official Public Records of Burnet County, Texas, for the Southeast corner of said 6.09 acres out of 63.09 acres, & for the Northeast corner of this tract;

Thence, with the West line of said 68.89 acres the following three (3) courses:

- 1) S 01°47'39" E a distance of 1,626.24 feet to a 1/2 inch iron rod with plastic surveyor's cap found,
- 2) S 01°38'06" E a distance of 1,007.26 feet to a 1/2 inch iron rod with plastic surveyor's cap found
- 3) S 02°10'01" E a distance of 300.22 feet to a 1/2 inch iron rod with plastic surveyor's cap found at the Northeast corner of a called 17.302 acres described in Volume 919, Page 654, Official Public Records of Burnet County, Texas, & for the Southeast corner of the herein described tract;

Thence, with the North line of said 17.302 acres, N 42°03'18" W a distance of 2,096.22 feet to a 1/2 inch iron rod found at the South corner of a called 7.35 acres described in Document No. 201507500, Official Public Records of Burnet County, Texas, at the East corner of a called 14.002 acres described in Document No. 202009491, Official Public Records of Burnet County, Texas, at the Northwest corner of a called 5.455 acres described in Document No. 201605826, Official Public Records of Burnet County, Texas, & for the Southwest corner of this tract;

Thence, with the East line of said 7.35 acres, N 23°00'52" E a distance of 1,341.11 feet to a 1/2 inch iron rod found in the South line of said 16.05 acre tract, at the Northeast corner of a called 6.64 acres described in Volume 901, Page 663, Official Public Records of Burnet County, Texas and for an interior corner of the herein described tract;

Thence with common line of said 16.05 acres and the herein described tract the following two (2) courses:

- 1) S 66°50'25" E a distance of 33.92 feet to a 1/2 inch iron rod found;
- 2) N 23°13'52" E a distance of 168.49 feet to the POINT OF BEGINNING, containing 57.00 acres.



I certify that this survey was made on the ground, that this plat correctly represents the facts found at the time of said survey and that this professional service substantially conforms to the current Texas Society of Professional Surveyors Standards and Specifications.

Chris Walterscheidt

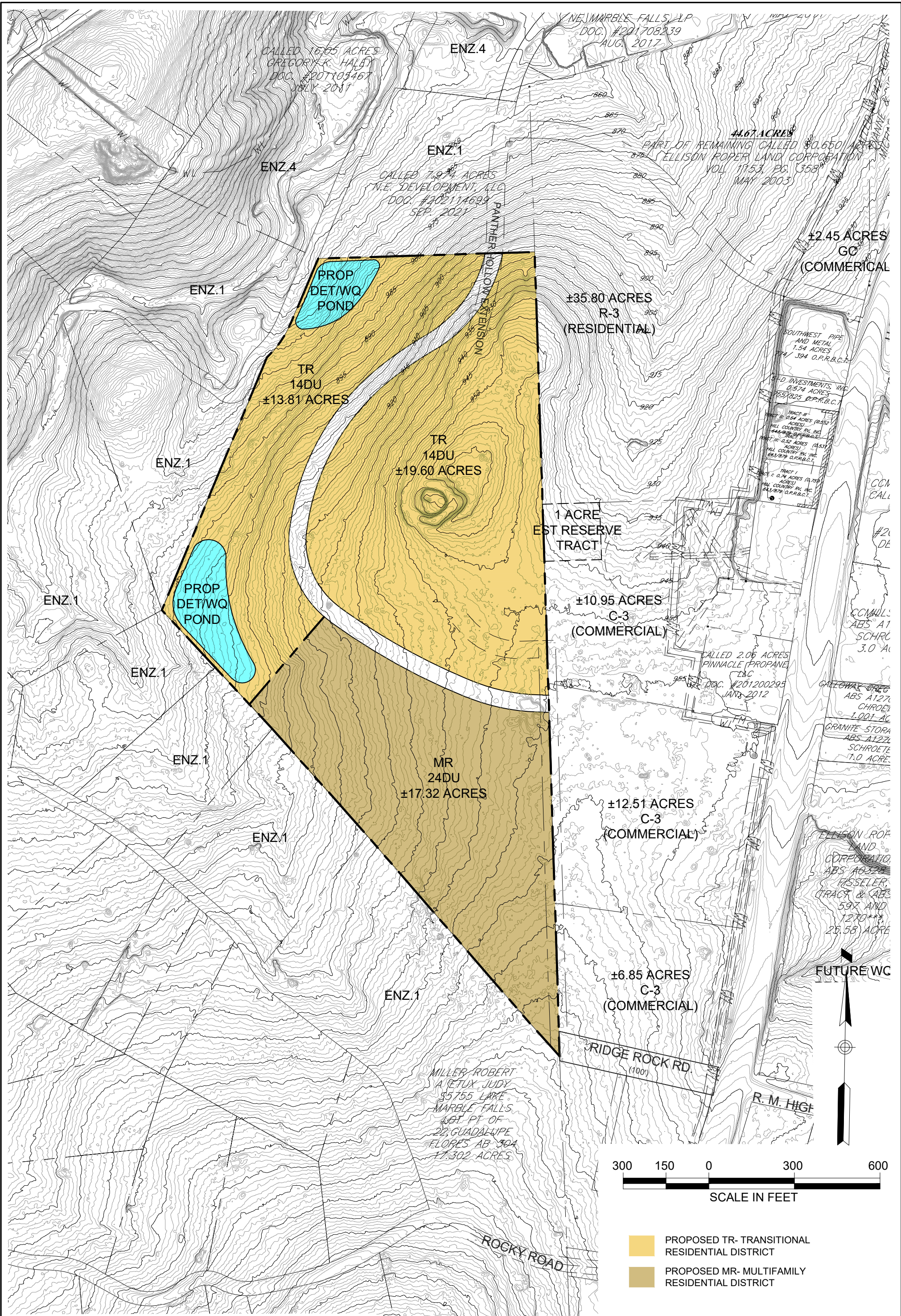
Chris Walterscheidt
R.P.L.S. 6180
Date: 08-09-2021

EXHIBIT TO ACCOMPANY LEGAL DESCRIPTION OF BOUNDARY AND IMPROVEMENT SURVEY OF A 57.00 ACRE TRACT SITUATED IN THE A. SCHROETER SURVEY NO. 4, A-1270 & THE GUADALUPE FLORES SURVEY NO. 7, A-304, BURNET COUNTY, TEXAS



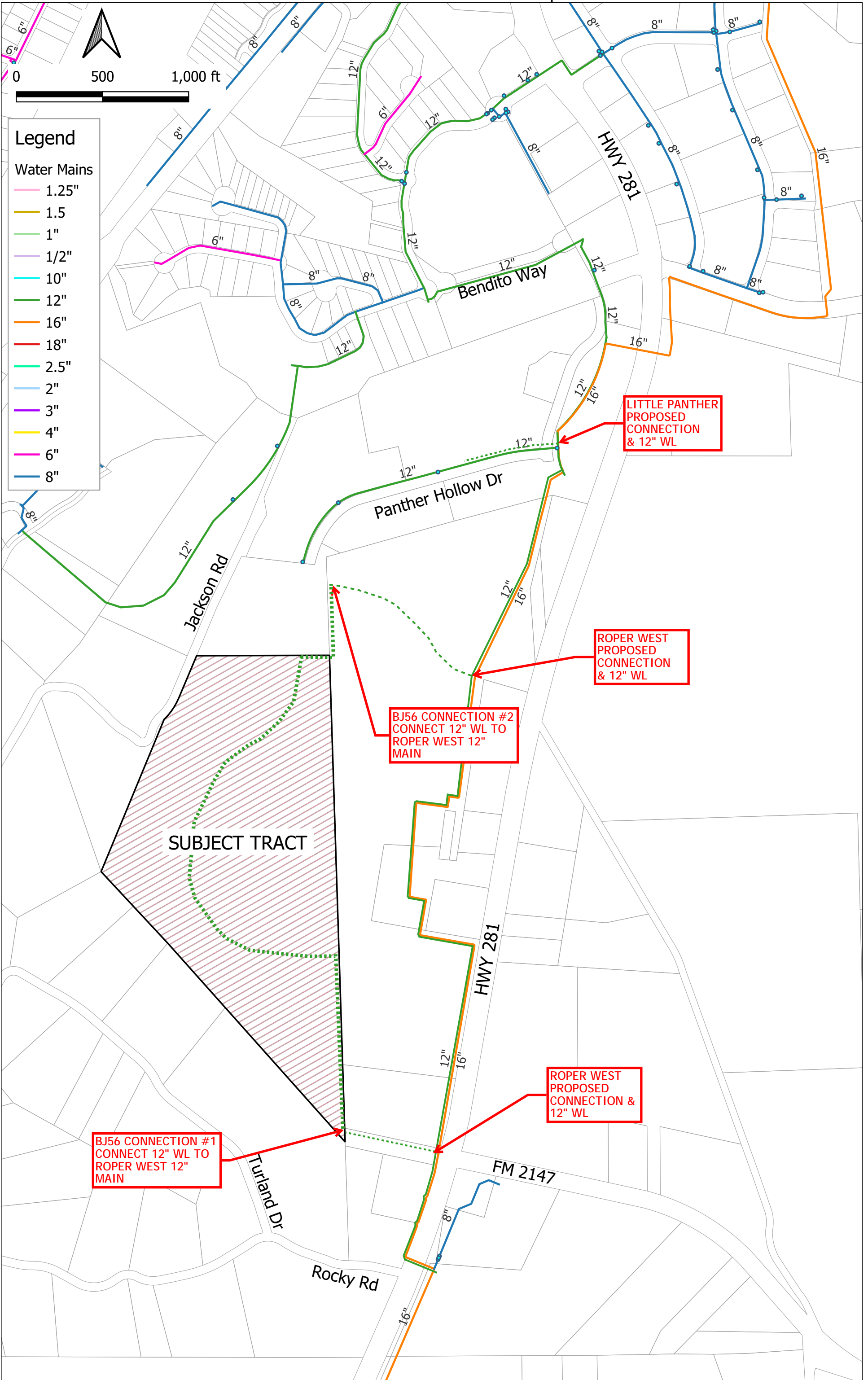
500 NORTH LOOP 1604 EAST, SUITE 200
SAN ANTONIO, TX 78232
(318)226-0100
www.landpoint.net
TBPELS NO. 10193814

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LJA087401C:\chibi\laid\property master plan.dwg Sep 06, 2022, 11:14am

Attachment D - Water Service Area Map



Legend

Water Mains

- 1.25"
- 1.5"
- 1"
- 1/2"
- 10"
- 12"
- 16"
- 18"
- 2.5"
- 2"
- 3"
- 4"
- 6"
- 8"

SUBJECT TRACT

LITTLE PANTHER PROPOSED CONNECTION & 12" WL

ROPER WEST PROPOSED CONNECTION & 12" WL

BJ56 CONNECTION #2 CONNECT 12" WL TO ROPER WEST 12" MAIN

ROPER WEST PROPOSED CONNECTION & 12" WL

BJ56 CONNECTION #1 CONNECT 12" WL TO ROPER WEST 12" MAIN

Attachment E - Water Demand Calculations

Project: Black Jack W&WW Assessment
 Job No.: 01109-223
 Date: 4/21/2023
 By: SCS/MG
 Title: Water Demand Summary

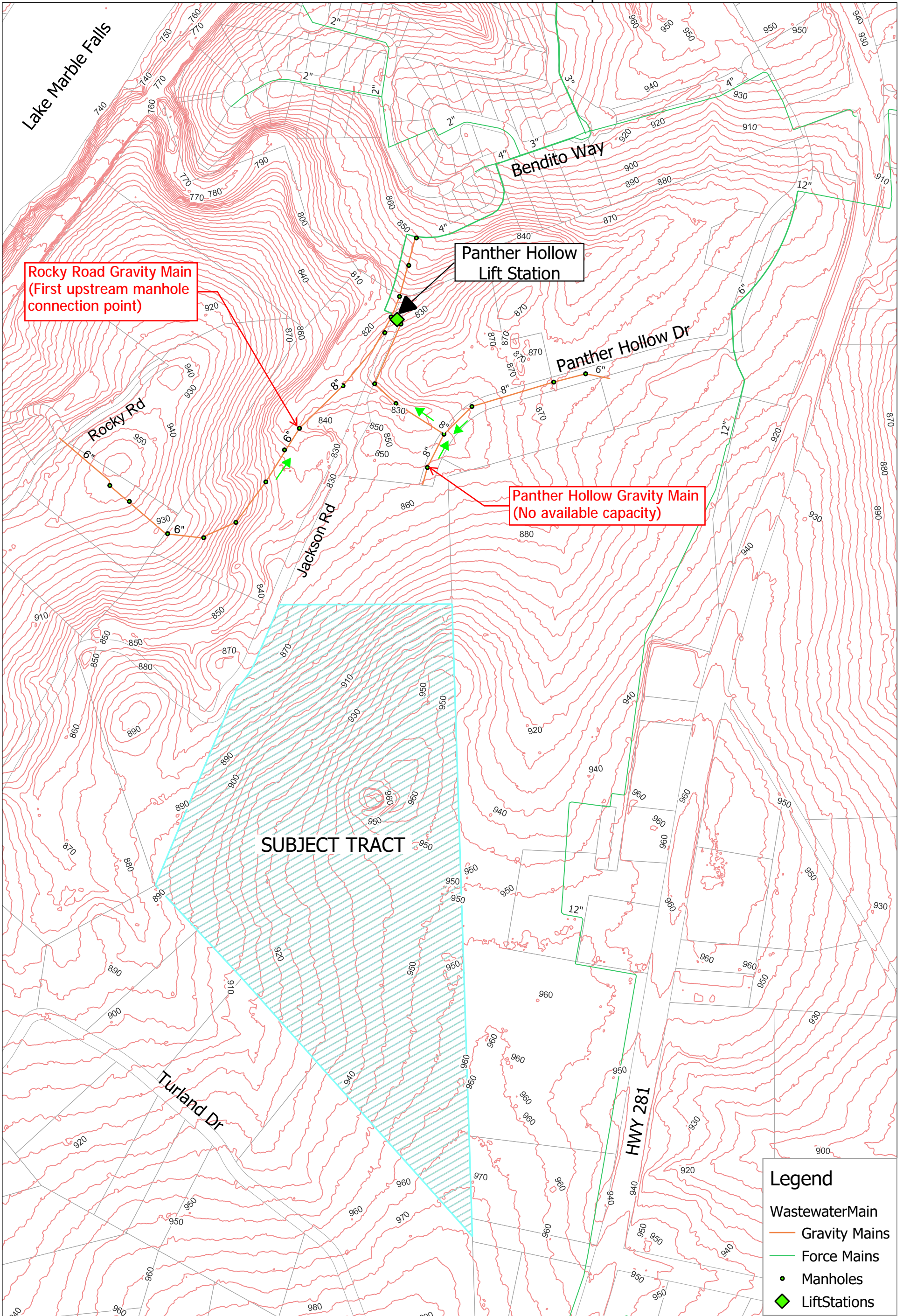
| WATER DEMAND SUMMARY | | | | | | |
|----------------------|------------|-----------|-----------------|-----------------|-----------------|-----------------|
| Land Unit | LUEs (no.) | Area (ac) | Water ADD (gpm) | Water PDD (gpm) | Water PHD (gpm) | % of Total Flow |
| Condo/Apts. | 540 | 57.0 | 113.4 | 226.8 | 302.4 | 100.0% |
| Totals | 540 | 57.0 | 113.4 | 226.8 | 302.4 | |

| Water Demand Flow Rates | | |
|-------------------------|-------|---------|
| Item | Qty | Units |
| ADD | 0.210 | gpm/LUE |
| PDD | 0.420 | gpm/LUE |
| PHD | 0.560 | gpm/LUE |

| Water Storage | | |
|---------------|---------|---------|
| Item | Qty | Units |
| LUEs | 540 | |
| Min. Elev. | 54,000 | gallons |
| Total | 108,000 | gallons |

| Emer. Demand Flow Rates | | |
|-------------------------|---------|-------|
| Item | Qty | Units |
| Fire Flow | 1,500.0 | gpm |
| Total PDD | 226.8 | gpm |
| Total EMD | 1,726.8 | gpm |

Attachment F - Wastewater Service Area Map



MillerGRAY
 Consulting. Engineering. Infrastructure.

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 Austin, Texas 78731
 Phone (512) 861-5300
 www.miller-gray.com
 TBPE FIRM REG. NO. F-16302



BLACK JACK WASTEWATER MAP

ATTACHMENT F
 WASTEWATER SERVICE AREA MAP

CITY OF MARBLE FALLS

APRIL 2023

PROJECT NUMBER: 01109-223

Attachment G - Wastewater Demand Calculations

Project: Black Jack W&WW Assessment
 Job No.: 01109-223
 Date: 4/21/2023
 By: SCS/MG
 Title: Wastewater Demand Summary

| WASTEWATER DEMAND SUMMARY | | | | | | | |
|---------------------------|------------|-----------|------------|------------|-----------|------------|-----------------|
| Land Unit | LUEs (no.) | Area (ac) | ADWF (gpm) | PDWF (gpm) | I&I (gpm) | PWWF (gpm) | % of Total Flow |
| Condo/Apts. | 540 | 57.0 | 90.2 | 225.5 | 29.7 | 255.1 | 100.0% |
| Totals | 540 | 57.0 | 90.2 | 225.5 | 29.7 | 255.1 | |

| Wastewater Flow Rates | | |
|-----------------------|-------|----------|
| Item | Qty | Units |
| ADWF | 240 | gpd/LUE |
| ADWF | 0.167 | gpm/LUE |
| PDWF | 600 | gpd/LUE |
| PDWF | 0.417 | gpm/LUE |
| I&I | 750 | gpd/acre |
| I&I | 0.521 | gpm/acre |