Countryside South

General Utility Report

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Atwell Project Number
21003308

Submitted by: Atwell, LLC

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INTRODUCTION

The purpose of this General Utility Report is to provide a preliminary summary of the utilities planned for the Countryside South development for the PUD Overall Development Plan Application submittal to the City of Fountain. The report identifies the required infrastructure for the proposed subdivision as well as demands and servicing plans for water including fire flow and wastewater. The report also speaks to the infrastructure plans for electric, gas, and communication utilities and identifies their respective providers.

The Countryside South subdivision Overall Development Plan prepared by Matrix Design Group dated September of 2021 proposes a total of 802 single-family residential units and a future School site development within the larger area of the site. The site area north of Wilson Road is dedicated to a future Fire Station development and Electrical Substation site. These commercial developments are included in system demand calculations.

WATER SYSTEM

The water system plan for the Countryside South development consists of connections to the City of Fountain's future 36" water distribution main to be constructed within Wilson Road. Off-site improvements to the City's water main system are required for this extension to be available which includes the extension of 36" water main from Old Pueblo Road to the railroad tracks, extended to east of Progress Drive for extension into the future 120' right-of-way of Wilson Road adjacent to the site. Extension of new 8" water distribution main is to loop throughout the subdivision with service taps to each lot. The Owner/Developer is to purchase water taps from the City at the time of permit.

According to the City of Fountain's 2006 Water Master Plan developed by Black & Veatch Corporation dated March 2007, the development is located within the Low Pressure Zone of the City's water system. The lots within the site are anticipated to have building pad elevations ranging from 5,500 to 5,550. The Low Pressure Zone has a minimum ground elevation of 5,500 feet to 5,600 feet according to Table 4-3 of the Water Master Plan. The City of Fountain Water Department has provided test pressures and flows for Hydrants 0209 and 0213 and the Countryside South water system has been preliminarily modeled for average day demand, peak hour, and max day demand with fire flow. The preliminary average daily demand pressures within the system are anticipated to be between 62-81 psi. The peak hour pressures are anticipated to be in the range of 42-62 psi. A max day demand with fire flow scenario yields pressures in the range of 55-74 psi. The system demands and pressures for the various scenarios are to be reported as a part of the preliminary utility report when the development is designed further.

Preliminary water demand projects are calculated below and are based on a unit flow factor of 330 gallons per day (gpd) per single-family equivalent (SFE) units, or 0.37 ac-ft per year per SFE based on the City's 2018 Water Efficiency Plan Table 6 for a household size between four and five occupants. The School's preliminary water demand is projected based on the Colorado WaterWise Council's figure of 1.7-2.7 kgal/student/year for the anticipated 815 student school. The Fire Station has a preliminary

average daily demand of 1,800 gpd for a typical fire house of approximately 18 staff. The Electrical Substation property is assumed to be unstaffed and have no water demand nor any irrigation needs.

A peaking factor of 2.5 for maximum day demand (MDD) and a peaking factor of 4.0 for peak hour demand (PHD) is applied.

Water Demand for Residential:
SFE: 802
Average Daily Demand: 264,660 gpd or 297 ac-ft/yr
Max Daily Demand (MDD): 264,660 gpd * 2.5 = 661,650 gpd
-or- 460 gpm
Peak Hour Demand (PHD): 736 gpm
Water Demand for Commercial:
School daily demand: 6,030 gpd
Fire Station daily demand: 1,800 gpd
Electrical Substation site daily demand: 0 gpd
Average Daily Demand: 7,830 gpd or 8.8 ac-ft/yr
Max Daily Demand (MDD): 7,830 gpd * 2.5 = 19,575 gpd
-or-13.6 gpm
Peak Hour Demand (gpm): 21.8 gpm

Water Demand Total:
Average Daily Demand: 272,490 gpd or 305.8 ac-ft/yr
Max Daily Demand (MDD): 272,490 gpd * 2.5 = 681,225 gpd
-or-473 gpm
Peak Hour Demand (gpm): 757 gpm

FIRE FLOW DEMAND

Fire flow requirements are based on International Fire Code which determines the required water main flow based on the size of the homes and construction type. It is anticipated that the single-family residences for Countryside South will consist of residences with a maximum home size of 4,000 square feet of Type V-B which is a wood frame construction. Based on these factors, the fire flow demand is 1,750 gallons per minute for a flow duration of 2 hours. Additionally, fire hydrants will be required to have a minimum spacing of 500 feet with a maximum distance from any point on the street or road frontage to the hydrant (engine hose lay) of 250 feet.

According to the anticipated static pressure for the site, the proposed 8-inch looped water main connection to the City of Fountain's water system are anticipated to provide sufficient fire flow throughout the development. As presented in the Water System section, max day demand with fire flow is anticipated to be within the range of 55-74 psi for the system.

WASTEWATER

The wastewater system for Countryside South requires a connection to the Fountain Sanitation District's future 12" wastewater main in the east-west stretch of Orleans Road from the existing main within the north to northwest stretch of Orleans Road near the intersection of Gould Road and Orleans Road. The residential areas of the subdivision's system gravity flows to this main extension. The northern parcels slated for future development of a Fire Station and Electrical Transmission Substation site may gravity flow to the existing 8" wastewater main in Wilson Road. A portion of the existing clay sewer main in Wilson Road will be rehabilitated as a part of this project, per coordination and direction by the sewer district. As a conservative measure in determining preliminary wastewater demand, it is assumed that the entire Countyside South development will flow to the Orleans Road extension including the northern area. The wastewater system plan for the subdivision includes the extension of 8" PVC collection mains throughout the development's roadways and any necessary utility easements with service taps to each lot. The Owner/Developer will purchase taps from the Fountain Sanitation District at the time of application for permit.

According to the Fountain Sanitation District Collection System Master Plan Update developed by Bohannan Huston dated March 21, 2017, the development lies within the Harold D. Thompson Regional Water Reclamation Facility (HDT RWRF) Basin which has a hydraulic design capacity of 2.5 MGD based on thirty day averages. Preliminary wastewater flow projects are presented below and are based on a unit flow factor of 250 gallons per day (gpd) per single-family equivalent (SFE) units. The School and Fire Station sites have assumed wastewater demands of 75 gpd/person, or in this case per student or firestation staffer. A peaking factor of 2.5 is applied for maximum day demand (MDD). The Electrical Substation site is assumed to be unstaffed and have no wastewater demand.

The pipe capacity of an 8-inch PVC schedule 40 gravity sewer main at the minimum allowable pipe slope of 0.60 percent according to Fountain Sanitation District standards, is 600,000 gpd. The maximum daily demand for wastewater for the Countyside South subdivision including its commercial developments falls within the system's 8-inch pipe capacity.

<u>Wastewater Demand for Residential:</u>
SFE: 802
Average Daily Demand: 200,500 gpd
Max Daily Demand (MDD): 501,250 gpd
<u>Wastewater Demand for Commercial:</u>
School Site Average Daily Demand: 61,125 gpd
Fire Station Average Daily Demand: 1,350 gpd
Electrical Substation Average Daily Demand: 0 gpd
Max Daily Demand (MDD): 156,188 gpd

<u>Wastewater Demand Total:</u>
Average Daily Demand: 262,975 gpd
Max Daily Demand (MDD): 657,438 gpd

In order to accommodate the anticipated 657,438 gpd, the wastewater main system is to exceed the minimum pipe slope and/or size and should be assessed further in a preliminary report when the development is designed further.

ELECTRIC, GAS, AND COMMUNICATIONS

Electric service to the Countryside South subdivision is to be provided by the City of Fountain. The development is to include underground electric lines throughout the subdivision for residential services with standard easements and lines installed per typical roadway and utility sections. In order to service the subdivision, a substation is required to be built in the area according to a Distribution Planning Study developed by the City in June of 2020. Transmission lines and easements are to be implemented for the new substation. For this reason, the northern area of the site north of Wilson Road includes an Electrical Substation site.

Gas service is to be provided by Black Hills Energy. The site lies within an older system with low pressure. In order to provide sufficient pressures to the subdivision, an approximately one-mile extension of the existing high pressure gas line at the southwest corner of Circle C Road and Link Rod due south and southwest. Distribution gas lines are to extend throughout the development with services to each unit.

Comcast is the preferred telephone and communications service provider to the Countryside South development. In order to provide service, existing infrastructure from the Ventana subdivision will need to be extended under the railroad tracks due east.

SUMMARY OF UTILITY ENTITIES:

Water: City of Fountain (Water Department)
Wastewater: Fountain Sanitation District
Electric: City of Fountain (Electrical Department)
Natural Gas: Black Hills Energy
Communications: Comcast

CONCLUSION

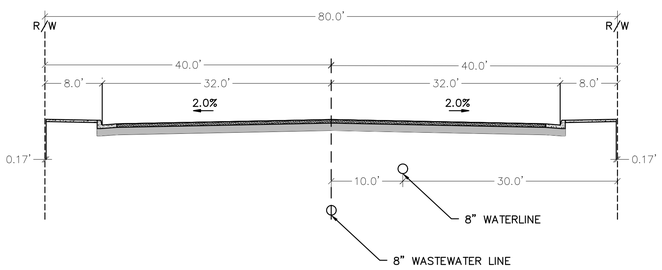
This report effectively demonstrates the general utility plan including water and wastewater demands and the required extensions for respective utilities including electric, gas, and communications lines. The master plans and extensions discussed in this report allows the City to have adequate water supply and treatment capacity as well as wastewater collection and treatment capacity by the Fountain Sanitation District. Water and wastewater public improvements are to be designed and constructed in accordance with the City of Fountain and Fountain Sanitation District Standards and Specifications and are to be dedicated to these entities upon completion and acceptance and in accordance to any stipulations laid out in the Annexation Agreement between the Owner/Developer and the City of Fountain and any utility entities. Included within the appendix of this report is a Conceptual Utility Improvements Map for the Countryside South subdivision.

REFERENCES:

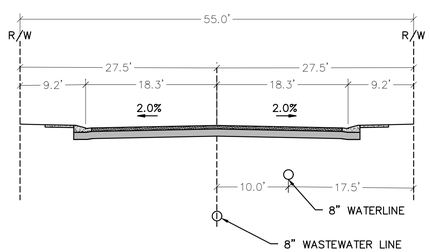
1. 2006 Water Master Plan prepared for the City of Fountain, prepared by Black & Veatch Corporation dated March 2007
2. 2018 Water Efficiency Plan City of Fountain El Paso County, Colorado prepared for the Colorado Water Conservation Board, prepared by Katie Helm of the City of Fountain
3. City of Fountain Water Department – data obtained from Staff
4. Benchmarking Task Force Collaboration for Industrial, Commercial, & Institutional Water Conservation prepared for the Colorado WaterWise Council, prepared by The Brendle Group, Inc. dated July 2007

APPENDIX A: CONCEPT UTILITY IMPROVEMENTS MAP

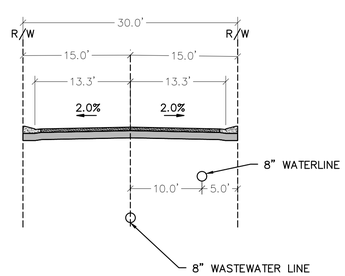
TYPICAL 80' R.O.W. ROADWAY SECTION
NOTE: ASPHALT AND BASE THICKNESS ARE ASSUMED AND WILL BE SPECIFIED AT THE TIME OF DESIGN

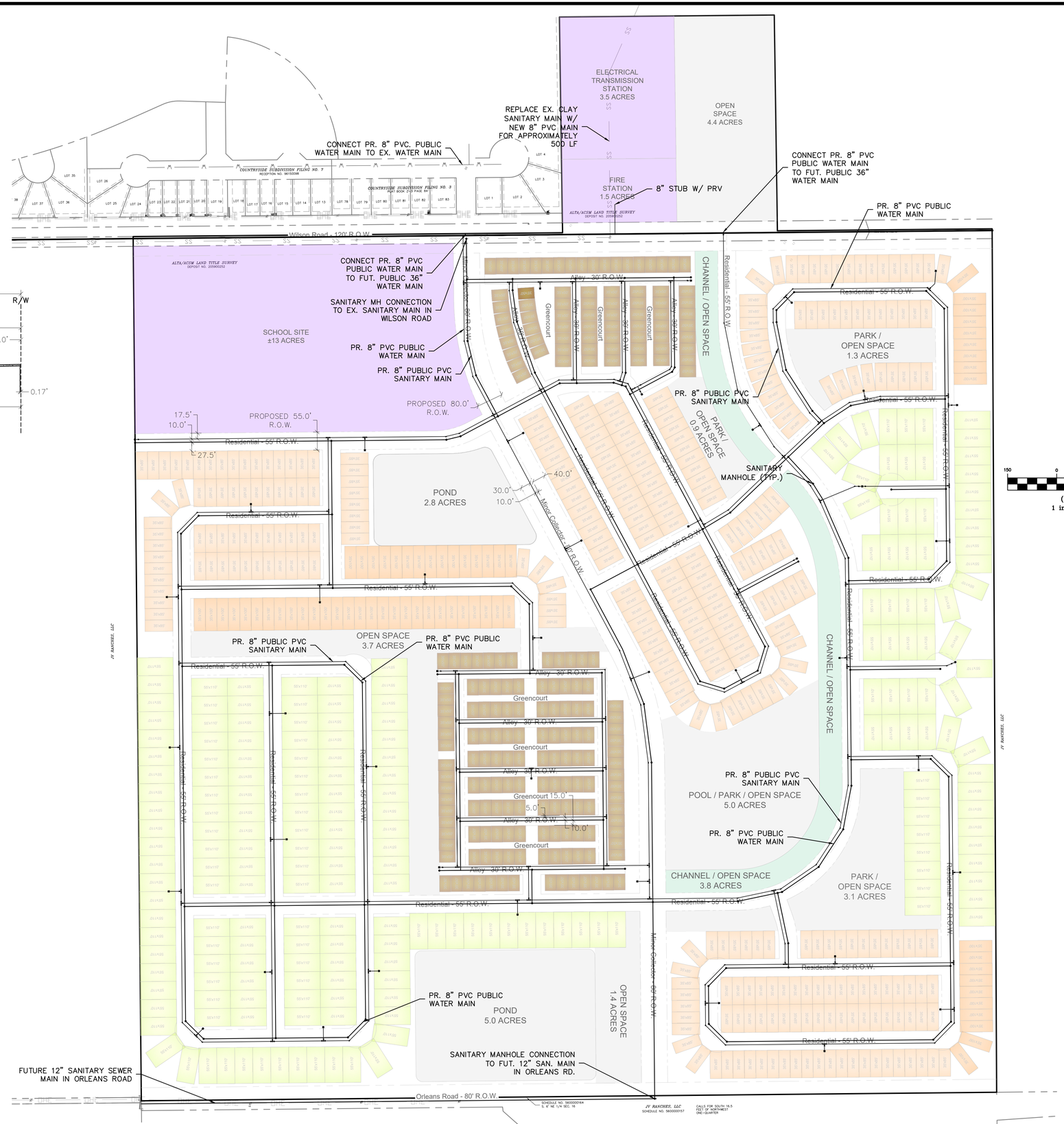


TYPICAL 55' R.O.W. ROADWAY SECTION
NOTE: ASPHALT AND BASE THICKNESS ARE ASSUMED AND WILL BE SPECIFIED AT THE TIME OF DESIGN



TYPICAL 30' R.O.W. ROADWAY SECTION
NOTE: ASPHALT AND BASE THICKNESS ARE ASSUMED AND WILL BE SPECIFIED AT THE TIME OF DESIGN





Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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UTILITY REPORT EXHIBIT
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CAD FILE: 21003308-UTILITIES EXHIBIT.DWG