

FINAL Basis of Design Report

APPROVED

APPROVED AS NOTED

REVISE AND RESUBMIT



Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance. For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY rrahman

DATE 4/2/2024

Vargo Quarter Horses LLC
APN: 216-70-005L

Prepared for:

Vargo Quarter Horses LLC
29607 N. Hayden Rd.
Scottsdale, AZ 85266

Parcel owner at:

APN: 216-70-005L

ASE #: 21-DR-2002#2

WASTEWATER FINAL BASIS OF DESIGN REPORT

Project # 23WHC802
Preliminary BOD Submittal: August 22, 2023
Final BOD Submittal: March 11, 2024

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Prepared By:



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Case #: 21-DR-2022#2

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INTRODUCTION

General Description

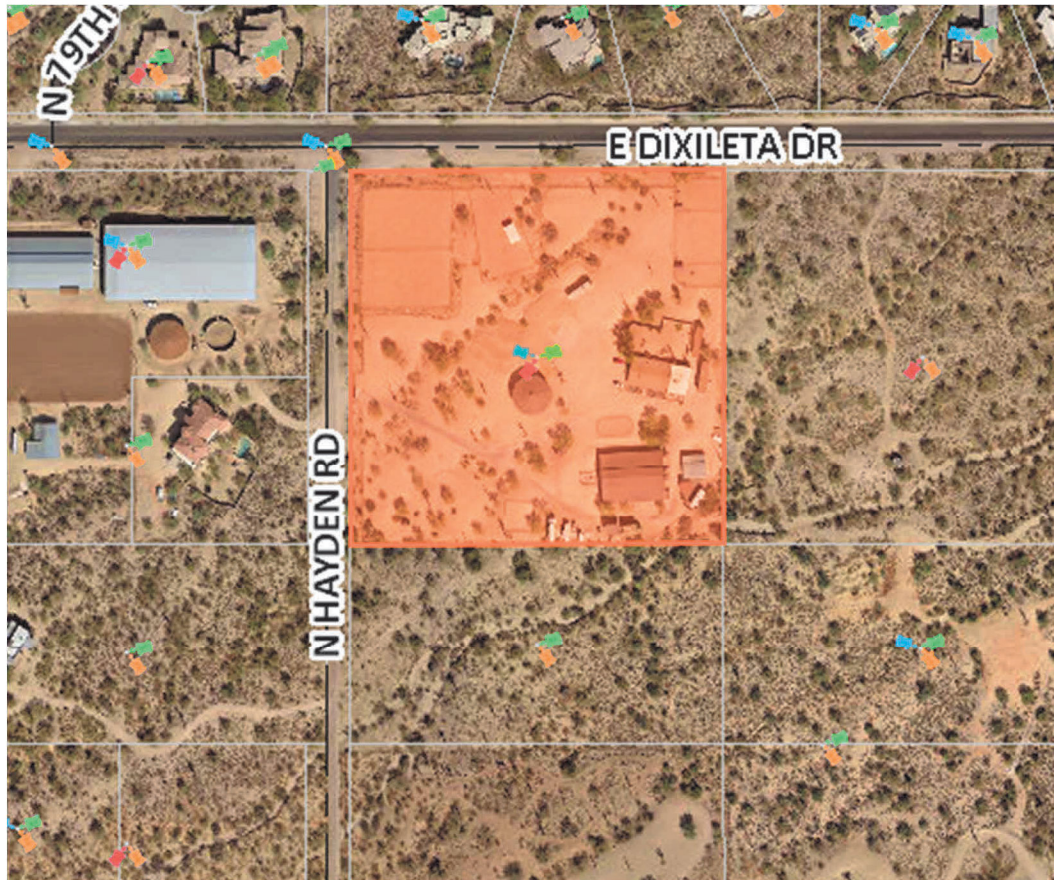
The Vargo Quarter Horses, LLC (VQHS) property is proposing to amend the previously approved site plan (21-DR-2002) to construct an 80’ by 100’ shop with labor quarters and abandoning the previously approved 80’x100’ Phase 2 Arena and turn-outs. In addition, the proposed construction will include the following site improvements: a concrete pad for a manure storage dumpster, a flagpole, and relocating the entry gate further into the property boundary. The proposed shop will be located in the northwestern portion of the parcel that is currently occupied by an equestrian arena. The existing parcel is an 8.8-acre site with a 4,833 square foot residence under roof (2,470 square foot living area) with an existing septic system and several auxiliary structures including an 80’x104’ barn, shed and shade structures. The additional 8,000 square foot shop will include labor quarters with a living area of 2,528 square feet. The labor quarters will include 4 bedrooms total. This report addresses the wastewater distribution system for the additional dwelling unit and will be constructed in compliance with City of Scottsdale’s Design Standards & Policies Manual (DS&PM).

Project Location

The property is located at 29607 N. Hayden Rd Scottsdale, Arizona 85266 with APN216-70-005L. The lot is 384,417 square feet (8.825 acres). The parcel is in the northwest quarter of the northwest quarter of Section 25, Township 5 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. This parcel is bound by N Hayden Road to the east, East Dixileta Drive to the north, and vacant parcel to the south and east.

Land Use

The parcel is currently zoned as Single Family Residential (RI-190), ESL FO with a conditional use permit for a Ranch.



Project Site

Existing Conditions

There are several structures currently located on site, including a house, barn, shed, covered pen, and multiple wall closures and shade structures. The existing house is 4,833 square feet (2,470 square feet living area) and has a Finished Grade Elevation (FGE) of 2256' located completely in parcel APN 216-70-005L. Driveway access to the parcel and the house, enters the property from Hayden Road on the west end of the parcel. The existing barn is 8,899 square feet, the shed is 115 square feet, and the covered pen has an area of 3,386 square feet. There are currently seven (7) shade structures with an additional total area of 4,846 square feet, the wall enclosures cover an area of 8,066 square feet. The wastewater system for the existing residence and barn is an on-site septic system. There is an existing main sanitary sewer line which runs along the south side of E. Dixileta Drive.

The current topography shows that the parcel generally slopes from the northeast to the southwest at an approximate average grade of 2%. There are two (2) washes that cross the property. The North Wash enters the northeast corner of parcel APN 216-70-005L and goes southwest (north of the house), along its path the wash flows through culverts under the main driveway and the new driveway to the shop before exiting the property in the southwest corner. The North Wash passes through the NAOS zones. The second wash (South Wash) has a small path across the southeast corner of the parcel APN 216-70-005L, flowing southwest. Wash paths and calculations are based on the hydrologic conditions as shown in FLO-2D.

48" sump, ejector pump and force main shall be private and shall be maintained by the Owner per DSPM Section 7-1.410.

Vargo Quarter Horses LLC
APN: 216-70-005L

Proposed Conditions

It is proposed that the new shop with labor quarters will connect directly to the existing sewer mainline in East Dixileta Drive. The new shop is a single dwelling unit. Additionally, it was requested that the existing wastewater facilities that are currently on a septic system on the property be connected to the sewer mainline in East Dixileta Drive. The existing septic system services the existing residence and existing equestrian barn. The existing residence is a single dwelling unit and the existing barn will also be modeled, conservatively, as a single dwelling unit. Due to topographical conditions this sewer system will be constructed as an ejector service line. The existing residence and existing barn will be serviced by a gravity sewer service line to a shared 48" diameter sump with an ejector pump to a pressurized line connecting to the new shop's gravity service and tie into the existing sewer mainline at a single location. The 48" sump will have the capacity for 250-gallon storage at the ejector pump to allow for 3 hours of storage at the Peak Day Design Flow for the existing facilities. The standard slope for gravity sewer services will be 1/4" /ft unless topography requires a 1/8" /ft slope. The typical minimum depth will be 4' and will meet all scour requirements under washes. The sewer connections and cleanouts will be installed per the City of Scottsdale's Design Standards & Policies Manual (DS&PM), dated January 2018. All new service lines located on the parcel will be private and maintained by the property owner.

1. New Shop Estimated Wastewater Design Flows

Design Population: (1 unit)(2.5 persons / unit) = 2.5 persons
Average Daily Flow, Q_{avg} : (2.5 persons)(100 gpppd) = 250 gpd
Peak Day (Design) Flow: $4(Q_{avg}) = (4)(250 \text{ gpd}) = 1,000 \text{ gpd} = 0.0015 \text{ cfs}$

2. Existing Facilities Estimated Wastewater Design Flows

a. Existing Residence

Design Population: (1 unit)(2.5 persons / unit) = 2.5 persons
Average Daily Flow, Q_{avg} : (2.5 persons)(100 gpppd) = 250 gpd
Peak Day (Design) Flow: $4(Q_{avg}) = (4)(250 \text{ gpd}) = 1,000 \text{ gpd} = 0.0015 \text{ cfs}$

b. Existing Barn

Design Population: (1 unit)(2.5 persons / unit) = 2.5 persons
Average Daily Flow, Q_{avg} : (2.5 persons)(100 gpppd) = 250 gpd
Peak Day (Design) Flow: $4(Q_{avg}) = (4)(250 \text{ gpd}) = 1,000 \text{ gpd} = 0.0015 \text{ cfs}$

Sewer generation from Barn and shop shall be based on square feet. However, this is a single parcel and Water is ok with current calculation.

For the combined portion of the existing facilities use a Peak Day Design Flow of 2,000 gpd or 0.003 cfs. For the final gravity service connection encompassing all site flows use 3,000 gpd or .0045 cfs

Hydraulic Design

The pipe hydraulics to the main sewer line along E Dixileta Drive is based on Manning's equation with $n = 0.013$. The full flow capacity (Q), velocity (V) and slopes (S) for a 4" system is as follows:

$$S = 0.0208 \text{ ft/ft } (1/4" / \text{ft})$$

$$Q = (1.49 / n)(R^{2/3} S^{1/2}) = (1.49 / 0.013)(0.08727)(0.08333)^{2/3} (0.0208)^{1/2} = 0.275 \text{ cfs}$$

$$Q = (0.275 \text{ cfs})(7.48 \text{ gal/cf})(3600 \text{ sec/hr})(24 \text{ hr/day}) = 177,724 \text{ gpd} \gg 3,000 \text{ gpd required}$$

The velocity under full flow conditions is:

$$V = (1.49 / n)(R^{2/3})(S^{1/2}) = (1.49 / 0.013) (0.08333)^{2/3} (0.0208)^{1/2} = 3.15 \text{ fps}$$

$$10.0 \text{ fps (max)} > 3.15 \text{ fps} > 2.5 \text{ fps (min)}$$

Conclusion

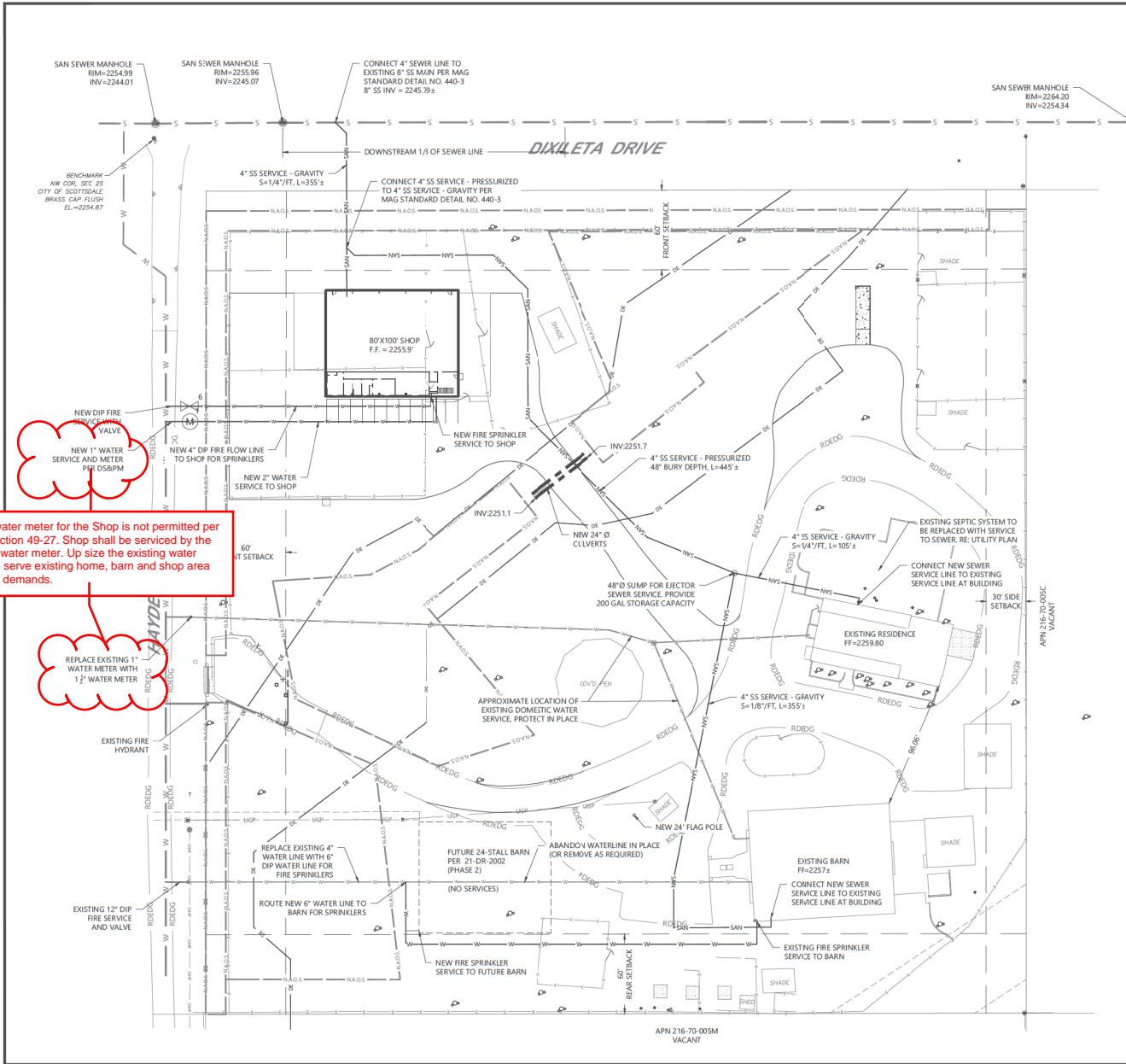
This report summarizes wastewater system improvements for serving the proposed new shop and existing facilities located at 29607 N Hayden Rd and has determined that:

- The proposed improvements include connections to the existing sewer line along Dixileta,
- The estimated wastewater design flow for the proposed shop and existing facilities is 750 GPD with an adjusted peak design flow of 3,000 GPD.
- An estimated construction schedule for the site improvements is 6/1/24 to 12/31/24 with the wastewater improvements being a small portion of the estimated timeline.
- All construction will be in compliance with applicable environmental laws and regulations.

APPENDIX

EXHIBIT A: PRELIMINARY UTILITY PLAN

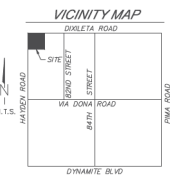
W:\Clients\23WHC020 - VARGO QUARTER HORSES\Working\33WHC020_G000 - DESIGN LAYOUTS.dwg C:\0.UTILITY 3/14/2024 5:15:15 PM



PROJECT CONTACTS

OWNER
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 SCOTTSDALE, AZ 85255
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WESTERN HERITAGE CONSULTING & ENGINEERING
 RYAN ALTENBURG
 PO BOX 2117
 MILLS, WY 82644
 RYAN@WESTERNHCE.COM



SITE DATA

A.P.N. ----- 216-70-005L
 SITE ADDRESS ----- 28907 N. HARVEY RD.
 NET AREA ----- 383,691 S.F.
 PARCEL ZONING ----- R1-160 CSL 40
 EXISTING RESIDENCE ----- 4,833 S.F.
 EXISTING BARN ----- 8,699 S.F.
 EXISTING SHEDS ----- 4,946 S.F.
 EXISTING SHED ----- 115 S.F.
 EXISTING LOT/DRY POOL ----- 1,386 S.F.
 EXISTING MALL ENCLOSURES ----- 8,066 S.F.
 NEW SHOP ----- 8,000 S.F.
 FUTURE BARN ----- 8,000 S.F.
 TOTAL ----- 46,183 S.F. OR 12% OPEN SPACE
 ----- 337,508 S.F.

PARKING INFORMATION

- 12 TOTAL PARKING STALLS. ONE PARKING STALL PER TWO HORSE STALLS (24 HORSE STALLS).
- PARKING STALL DIMENSIONS: 8' X 16'
- ACCESSIBLE PARKING NOT REQUIRED.

LEGEND

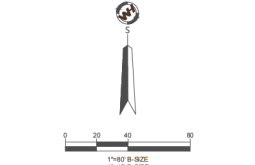
- FOUND MONUMENT (TYPE SHOWN)
- PROPERTY LINE
- 2255 --- EXISTING CONTOUR
- SECTION LINE
- UTILITY EASEMENT LINE
- FENCE
- MASONRY WALL
- CONCRETE
- PAVEMENT
- X LIGHT POLE
- T DOWN GUY
- WATER METER
- FIRE HYDRANT
- ELECTRIC SANCTION BOX
- N.A.O.S. NATURAL AREA OPEN SPACE
- D.E. DRAINAGE EASEMENT
- T.E. TRAIL EASEMENT
- SAGUARO CACTUS
- BUILDING SETBACK LINE
- SANITARY MANHOLE
- EXISTING WATERLINE
- EXISTING SEWER
- OHP EXISTING OVERHEAD POWER
- RDE/EG EXISTING EDGE OF DRIVEWAY
- EXISTING RR/RAP
- NEW ASPHALT MILL TAILING DRIVEWAY (OR GRAVEL/ROAD BASE)

LEGAL DESCRIPTION

FOR TITLE REPORT:
 THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 5 NORTH, RANGE 4 EAST OF THE 6TH AND 5TH MERIDIAN, MARICOPA COUNTY, ARIZONA.

BENCHMARK

NECOT 60M3 POINT NO. 42533-1
 NORTHWEST CORNER SECTION 25
 CITY OF SCOTTSDALE BRASS CAP FLUSH
 EL.=2254.67 NAVD 88



NOTES

- ALL NEW SANITARY SEWER SERVICE LINES LOCATED ON THE PARCEL SHALL BE PRIVATE SERVICE LINES.
- ALL NEW CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE W/ CITY OF SCOTTSDALE (COS) DESIGN SPECIFICATIONS AND DETAILS.
- EXISTING SEPTIC SYSTEMS SHALL BE ABANDONED IN PLACE. NEW SERVICE LINES SHOULD CONNECT TO EXISTING SEWER SERVICE LINES AT BUILDING PERIMETER, CONFORM INVERT ELEVATIONS OF EXISTING SEWER SERVICE LINES AND PILE SIZE AT TIME OF CONSTRUCTION. IF EXISTING SERVICE LINES VARY FROM DESIGN, REPLACE SEWER SERVICE LINES AS NECESSARY.
- ALL SPRINKLER SUPPLY LINES & SERVICE TO BE IN COMPLIANCE W/ OS&PM & NFPA 13.
- ALL WATER AND SEWER LINES SHALL BE PROTECTED PER COS DESIGN SPECIFICATIONS AND DETAILS.
- BOOSTER PUMPS SHALL BE PROVIDED AT ALL WATER SERVICE LINES TO MEET MINIMUM PRESSURES AT HIGHEST FINISHED FLOOR ELEVATIONS PER THE OS&PM.

A new water meter for the Shop is not permitted per SRC Section 49-27. Shop shall be serviced by the existing water meter. Up size the existing water meter to serve existing home, barn and shop area for peak demands.

REPLACE EXISTING 1" WATER METER WITH 1 1/2" WATER METER

CASE# 21-DR-2002#2

VARGO QUARTER HORSES, LLC

PRELIMINARY UTILITY SITE PLAN

CITY OF SCOTTSDALE, AZ

Drawn By:	CM	Checked By:	MSP	Reviewed By:	RLA	Scale:	
Date:	3/14/24	Date:	3/14/24	Date:			
Description:	DBB APP SUBMITTAL - RESUBMIT						

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Job Number: **23WHC802**
 Sheet Number: **C3.0**