HILGARTWILSON
ENGINEER | PLAN | SURVEY | MANAGE

MASTER WATER REPORT

FOR

HAWES CROSSING

MESA, ARIZONA

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1.0 EXECUTIVE SUMMARY

Hawes Crossing (the Project) is a proposed approximate 1,132 acre master planned mixed use development generally located west of Ellsworth Road, east of Sossaman Road, north of Watson Road and south of Elliot Road in the City of Mesa, Arizona. The Project will consist of up to 4,615 residential units, approximately 426 acres of commercial, industrial, and/or research and development land uses, and approximately 52 acres of developed open space.

This Master Water Report has been prepared in support of the General Plan Amendment (GPA) for Hawes Crossing. This report identifies and evaluates the proposed water system infrastructure for serving the Project in accordance with City of Mesa design criteria. Estimated water demands for the Project have been calculated based on the proposed land uses and current City design criteria. This report also identifies the anticipated average day, maximum day, peak hour, and maximum day plus fire flow demands.

The Project lies within both the Falcon Field service zone (pressure zone) and the Desert Wells service zone. The proposed water system has been designed in accordance with current City of Mesa design criteria as outlined in the City's *Engineering Procedure Manual: 2019 Engineering & Design Standards* (City of Mesa, 2019). The average day, maximum day, and peak hour demands anticipated for the Falcon Field portion of the Project are 1,576,340 gpd (1,094.7gpm), 2,981,080 gpd (2,070.2 gpm), and 4,385,820 gpd (3,045.7 gpm), respectively. The average day, maximum day, and peak hour demands anticipated for the Desert Wells portion of the Project are 397,202 gpd (275.8 gpm), 738,524 gpd (512.9 gpm), and 1,079,846 gpd (749.9 gpm), respectively.

The minimum required water system improvements identified in this report to serve the Project will comprise the backbone of the Project's water system and consists of proposed 8-inch and 12-inch water distribution mains located within the arterial and collector streets. The City required water system improvements consist of 12-inch water mains in all half-mile street alignments and 16-inch water mains in all one-mile street alignments. Additionally, the City requires a 30-inch water transmission main in Hawes Road from the Loop 202 to Elliot Road. The Falcon Field portion of the water system will be served by the Signal Butte Water Treatment Plant (SBWTP), which is currently being constructed east of the Project at the intersection of Elliot Road and Signal Butte Road. The Desert Wells portion of the water system will be served by the Brown Road Water Treatment Plant (BRWTP) and the Signal Butte Water Treatment Plant (SBWTP). It is anticipated that the water infrastructure serving the Project will be owned and operated by the City of Mesa.

The Project is divided into development blocks, denoted as Villages, for the purposes of development sale offerings. These Villages are anticipated to be developed in phases specific to the developers needs and the water system infrastructure will similarly be constructed in phases as required to serve each Village or Village phase in the Project. As such, the offsite water infrastructure required to serve the Project will be constructed at the same time each Village or Village phase is developed. Individual parcels within specific villages may develop individually, however, and the

offsite water infrastructure required to serve that parcel will be constructed at the same time as the parcel is developed. Furthermore, the water mains that are installed in each Village, Village phase, or individual parcel will be sized for build-out conditions.

A hydraulic model was prepared for the proposed minimum required water system for average day, maximum day, peak hour, and maximum day plus fire flow conditions. The model results show the proposed minimum required water system infrastructure meets current City of Mesa design criteria and can adequately convey projected demands and fire flow throughout the development.

2.0 INTRODUCTION

2.1 Background and Project Location

Hawes Crossing (the Project) is located in the City of Mesa (the City) within portions of Sections 8, 16, 17, 20, and 21 of Township 1 South, Range 7 East of the Gila and Salt River Base and Meridian. The Project is comprised of an approximate 1,132-acre master planned mixed use development located to the east and west of Loop 202 approximately between Warner Road and Elliot Road. The Project is generally bound by Elliot Road on the north, Ellsworth Road on the east, Warner Road on the south, and Sossaman Road on the west.

Figure 1 in Appendix A provides a vicinity map for the Project.

2.2 General Description

The Project is planned as a mixed-use development, which will include single family, medium density, and high density residential areas, parks and open space, along with office, mixed use, commercial, and light industrial areas. The land use plan for the Project is presented in Figure 2 (Proposed Land Use Plan) in Appendix A. The site currently consists of existing dairies, light industrial and agricultural districts as well as estate residential properties (RU-43). The site generally slopes from east to west at approximately 0.4 percent. The existing ground at the Project contains numerous undulations formed by local ridges and ravines. Overall, the existing ground slopes towards Sossaman Road and the Roosevelt Canal. Portions of the Project are within the City limits, with the remaining area under the jurisdiction of Maricopa County. It is assumed the areas within Maricopa County will be annexed into the City of Mesa and a General Plan Amendment and PAD Rezone will be processed and approved by the City.

The Project is located within the City of Mesa water service area within the Falcon Field service zone (pressure zone) and the Desert Wells service zone. Water infrastructure for the Project will be owned and operated by the City of Mesa. The City's pressure zone boundary is shown on Figures 4 and 5 in Appendix A.

2.3 Purpose of Report

This Master Water Report has been prepared in support of the Hawes Crossing General Plan Amendment (GPA) and supports the proposed land uses as described

in the GPA. The purpose of this Master Water Report is to identify and evaluate the proposed water infrastructure and distribution system required to serve the Project based on the current land use plan and current City of Mesa design standards. A copy of the proposed land use plan is provided in Figure 2 in Appendix A.

This report identifies the projected water demands for the Project for average day, maximum day, peak hour, and maximum day plus fire flow conditions. It also presents results from a hydraulic model of the proposed minimum required water infrastructure to serve the Project. The demand calculations presented in this Master Water Report are based on the current land uses planned for each parcel. As the Project progresses into the pre-plat phase, the demand calculations for Hawes Crossing will be refined and the projected demands may change. The water analysis presented in this report is based on the City of Mesa *Engineering Procedure Manual: 2019 Engineering & Design Standards* (City of Mesa, 2019).

2.4 Previous Studies

There are no known previous water studies or plans for the Project site.

3.0 DESIGN CRITERIA

3.1 City of Mesa Design Criteria

The proposed water system for the Project has been designed in accordance with current City of Mesa design criteria as outlined in the City of Mesa *Engineering Procedure Manual: 2019 Engineering & Design Standards* (City of Mesa, 2019). A summary of the design criteria is provided in Table 1.

TABLE 1 WATER SYSTEM DESIGN CRITERIA			
Category		Value	Unit
Population Density			
	Medium Density Residential (LDR) (2-4 DU/acre)	3.0	per dwelling unit
	Medium Density Residential (LMDR) (4-6 DU/acre)	3.2	per dwelling unit
	Medium Density Residential (MDR) (6-10 DU/acre)	2.7	per dwelling unit
	High Density Residential (MHDR) (10-15 DU/acre)	2.0	per dwelling unit
	High Density Residential (HDR) (15+ DU/acre)	1.7	per dwelling unit
Demand Factors			
	Medium Density Residential (LDR) (2-4 DU/acre)	420	gpd/du
	Medium Density Residential (LMDR) (4-6 DU/acre)	400	gpd/du
	Medium Density Residential (MDR) (6-10 DU/acre)	254	gpd/du
	High Density Residential (MHDR) (10-15 DU/acre)	194	gpd/du
	High Density Residential (HDR) (15+ DU/acre)	154	gpd/du
	Commercial, Office, Industrial, Research & Development	1,500	gpad
	Maximum Day	2.0	x Average Day Demand
	Peak Hour	3.0	x Average Day Demand
Peaking Factors (Developed Open Space)			
	Maximum Day	N/A	
	Peak Hour	N/A	
Average Day, Maximum Day, and Peak Hour System Performance			
	Minimum Pressure (static)	40	psi
	Maximum Pressure*	80	psi
	Maximum Velocity	5	fps
Maximum Day + Fire Flow System Performance			
	Minimum Pressure	20	psi
	Maximum Velocity	10	fps
	Residential Fire Flow**	1,500	gpm for 2 hours
	Commercial/Industrial Fire Flow**	3,000	gpm for 2 hours
Minimum Pipe Diameter		8	inches
Hazen Williams 'C' Factor		130	

Notes:
*Any structure experiencing pressures greater than 80 psi shall have an individual PRV.
** Fire Flow based on City of Mesa Fire Code

4.0 WATER DEMANDS

4.1 Land Use

The Project will consist of up to 4,615 residential units and approximately 426 acres of non-residential use including commercial, industrial, research and development and other mixed used development. The Project will also incorporate up to 51.7 acres of open space including parks and amenities. Land use allocations and densities are assumed from target density ranges provided in the *Mesa Urban Development - Conceptual Land Use Master Plan* (Greey Pickett, 2019). Figure 2 in Appendix A shows the anticipated land uses throughout the Project. Table 3 below summarizes these anticipated land uses. Table B.1 in Appendix B shows the land use budget for each parcel within the Project while Table B.3 in Appendix B summarizes the land uses based on their zoning category. Table B.2 in Appendix B summarizes the land uses by their respective development Village. Land uses, areas, densities, and dwelling unit counts are subject to change as the Project moves from master planning to preliminary and final design.

TABLE 2
PROPOSED LAND USE SUMMARY

Assigned Parcel Group	Zoning Category	Proposed Use	Gross Area (ac)	Assumed Density (du/ac)	Potential Dwelling Units	Commercial / Industrial Gross Area (ac)
FALCON FIELD SERVICE ZONE						
A	RS-6 / RSL-4.0	Medium Density Residential (LMDR)	128.1	5.0	642	-
B	RSL-2.5	Medium Density Residential (MDR)	203.1	10.0	2,031	-
C	RM-5	High Density Residential (MHDR)	41.7	25.0	1,044	-
D	MX	Mixed Use	113.5	12.0	685	57.0
E	LI	Light Industrial	68.9	-	-	68.9
F	LC/GC	Light/General Commercial	93.9	-	-	93.9
G	OC	Office	5.8	-	-	5.8
Park/Open Space (Turf Irrigation)			39.0	-	-	-
FALCON FIELD SERVICE ZONE SUBTOTAL:			**694.0**	**-**	**4,402**	**225.6**
DESERT WELLS SERVICE ZONE						
D	MX	Mixed Use	35.3	12.0	213	17.7
E	LI	Light Industrial	133.5	-	-	133.5
F	LC/GC	Light/General Commercial	48.8	-	-	48.8
Park/Open Space (Turf Irrigation)			12.7	-	-	-
DESERT WELLS SERVICE ZONE SUBTOTAL:			**230.3**	**-**	**213**	**200.0**
Other/Streets/Etc.			207.5	-	-	-
GRAND TOTAL:			**1,131.8**	**-**	**4,615**	**425.6**

4.2 Water Demand Calculations

Anticipated water demands for the Project have been calculated in accordance with the design criteria listed in Table 1 and the land uses and densities listed in Table 2. A summary of the total water demands for the Project are presented in Table 3 below. Table B.1 in Appendix B presents more detailed water demand calculations for the Project while Table B.2 in Appendix B presents detailed water demand calculations by phase.

TABLE 3
TOTAL WATER DEMAND SUMMARY

Service Zone	Average Day Demand		Maximum Day Demand		Peak Hour Demand	
	gpd	gpm	gpd	gpm	gpd	gpm
Falcon Field	1,576,340	1,094.7	2,981,080	2,070.2	4,385,820	3,045.7
Desert Wells	397,202	275.8	738,524	512.9	1,079,846	749.9
GRAND TOTAL:	**1,973,542**	**1,370.5**	**3,719,604**	**2,583.1**	**5,465,666**	**3,795.6**

5.0 WATER SYSTEM INFRASTRUCTURE

5.1 Water Service Zones

The Project falls within both the Falcon Field service zone and the Desert Wells service zone. The service zone boundary generally runs along Hawes Road between Baseline Road and Elliot Road and along the east side of the Loop 202 between Elliot Road and Warner Road. All Project parcels west of this service zone boundary fall within the Falcon Field service zone while Project parcels east of this boundary fall within the Desert Wells service zone. This service zone boundary is shown on Figures 4, 5, and 6 in Appendix A.

5.2 Existing Falcon Field Water System Infrastructure

Water for the Falcon Field service zone is sourced from the Salt River Project, the Central Arizona Project, and a network of wells distributed throughout the area. Water treatment is currently provided by the Val Vista Water Treatment Plant and the CAP Brown Road Water Treatment Plant. An excerpt from the City of Mesa *Engineering Procedure Manual: 2019 Engineering & Design Standards* (City of Mesa, 2019), attached in Appendix C, shows the City of Mesa pressure zone boundaries.

As shown on Figures 4 and 5 in Appendix A, existing water infrastructure in the Project vicinity includes a 24-inch water transmission main along Sossaman Road with a 20-inch stub out in Elliot Road and a 16-inch stub out in Warner Road. 12-inch stub outs are placed incrementally along this existing 24-inch water main between Paloma Ave and Warner Road. A 12-inch water main exists along Paloma Ave, 80th Street, and Hawes Road from Guadalupe Road to the Paloma Ave alignment. A 16-inch water main in Guadalupe Road connects these 12-inch water mains. The existing 24-inch water main in Sossaman Road continues south to cross the Santan Freeway (Loop 202) and connect to an existing 24-inch water main in Ray Road. A

30-inch water main runs along Hawes Road from Ray Road to just north of the Santan Freeway (Loop 202), where it stubs out at the southern boundary of the Project. Per City of Mesa staff, a 30-inch transmission water main is currently under construction along Elliot Road between Sossaman Road and Hawes Road, with an upsized 42-inch transmission water main from Hawes Road to the Loop 202. Similarly, a 30-inch transmission water main is planned for Hawes Road from the Santan Freeway (Loop 202) to Elliot Road. A 16-inch water main exists in Warner Road and Elliot Road underneath the Loop 202. These 16-inch water mains are sleeved and capped on both ends.

Construction was completed in June of 2018 at the Signal Butte Water Treatment Plant (SBWTP), located at the northeast corner of Elliot Road and Signal Butte Road. The new SBWTP will treat Colorado River water supplied by the Central Arizona Project (CAP) canal to drinking water standards. The plant was initially built as a 24 million gallon per day (MGD) facility, with a planned build-out capacity of 48 MGD. A proposed booster station will convey water from the Signal Butte WTP to the Falcon Field service zone through a 42-inch water main just north of Elliot Road. This 42-inch water main will connect to a 30-inch water main at the intersection of Elliot Road and Hawes Road and extend west and south to existing infrastructure within the Falcon Field service zone.

5.3 Existing Desert Wells Water System Infrastructure

Water for the Desert Wells service zone is sourced from the Central Arizona Project and a network of wells distributed throughout the area. Water treatment is currently provided by the CAP Brown Road Water Treatment Plant and the Signal Butte Water Treatment Plant (SBWTP). An excerpt from the City of Mesa *Engineering Procedure Manual: 2019 Engineering & Design Standards* (City of Mesa, 2019) attached in Appendix C shows the City of Mesa pressure zone boundaries.

As shown on Figure 4 in Appendix A, existing water infrastructure in the Project vicinity includes 16-inch water mains in Ellsworth Road and in Elliot Road, east of Ellsworth Road. A 12-inch water main runs along Warner Road from Ellsworth Road to just east of the Loop 202. This 12-inch water main is currently not connected to the existing 16-inch water main sleeved under the Loop 202. A 16-inch water main exists in Elliot Road and in Warner Road underneath the Loop 202. These 16-inch water mains are sleeved and currently capped on both ends. A 12-inch water main extends west from Ellsworth Road in Elliot Road along the frontage of the Dignity Health East Mesa Hospital.

5.4 Proposed Falcon Field Water System Improvements (Minimum Required for the Project)

As shown in Figure 4 of Appendix A, the minimum required water system improvements to serve the Project consist of a network of looped 8-inch and 12-inch water mains as well as existing offsite 12-inch, 16-inch, 20-inch, 24-inch, 30-inch, and 42-inch water mains. Proposed 8-inch and 12-inch water mains along Warner Road, 80th Street, and Hawes Road will distribute water from existing infrastructure surrounding the Project. Proposed 12-inch water mains will also distribute water within the Project area along collector streets and in streets surrounding the commercial, industrial, and research and development land use areas. Looped 8-inch

water mains will comprise the rest of the on-site water system and distribute water to residential and other areas of the Project. Stub outs for adjoining offsite developments are anticipated, however, the locations of these stub outs will be identified during the preliminary and final design stages. Although the City is requiring a 30-inch water transmission main in Hawes Road from Elliot Road to the Loop 202, this transmission water main is not required for serving the development. This water main is discussed further in Section 5.6 of this report.

As shown on Figure 4 in Appendix A, the proposed minimum required water system improvements for the Project have multiple points of connection to the existing City of Mesa water system. There will be one point of connection to the existing 12-inch water main at the intersection of Paloma Ave and 80th Street and one point of connection at the intersection of Hawes Road and the Peralta Avenue alignment. A third point of connection will be made along the existing 24-inch water transmission main in Sossaman Road at the 16-inch water stub out in Warner Road. Other connections to the City of Mesa water system are anticipated as the City expands its water transmission and distribution network into the area, including connections to the 30-inch and 42-inch water transmission main in Elliot Road at 80th Street and Hawes Road. Connections to these large diameter transmission mains will be limited so as to limit valves along the transmission mains. All lateral water main connections to these transmission mains will be 12-inches or larger.

As discussed previously, the Project is anticipated to be served by the Signal Butte Water Treatment Plant (SBWTP), which is being constructed at the northeast corner of Elliot Road and Signal Butte Road. Further discussions will be held with the City of Mesa during the preliminary and final design stages regarding any offsite water storage and pumping facility improvements that may be required to serve the Project. However, based on the projected water demands for the Falcon Field portion of the Project, approximately 5,070 gpm of firm pumping capacity (maximum day demand of 2,070 gpm plus 3,000 gpm of fire flow) will be required at build-out.

5.5 Proposed Desert Wells Water System Improvements (Minimum Required for the Project)

As shown on Figure 4 of Appendix A, the minimum required water system improvements to serve the Desert Wells portion of the Project will be served by a network of looped 8-inch and 12-inch water mains as well as existing offsite 12-inch and 16-inch water mains. Proposed 12-inch water mains will comprise the backbone of the Desert Wells portion of the Project by looping around the parcels on internal collector streets as well as in Elliot Road from Ellsworth Road to the Loop 202. 8-inch water mains will generally be routed through the parcels. Connections to the existing City water system will be along the existing 16-inch water main in Ellsworth Road and the existing 12-inch water mains in Warner Road and Elliot Road. Stub outs for adjoining offsite developments are anticipated, however, the locations of these stub outs will be identified during the preliminary and final design stages. Based on the projected water demands for the Desert Wells portion of the Project, approximately 3,513 gpm of firm pumping capacity (maximum day demand of 513 gpm plus 3,000 gpm of fire flow) will be required at build-out.

5.6 City Required Water Main Upsizing

Per discussions with the City of Mesa and requirements set forth in the *Engineering Procedure Manual: 2019 Engineering & Design Standards* (City of Mesa, 2019), certain water mains within the Project must be upsized. While Figure 4 in Appendix A illustrates the minimum line sizing required to meet the demands, pressures, and fire flows of the Project, Figure 5 in Appendix A illustrates the necessary upsizing of specific water mains and water main realignments for minimizing connections to the City's transmission water mains and to meet the City's design and future water resources planning requirements. Listed below are the changes incorporated into Figure 5 in Appendix A. Figure 5 in Appendix A will govern line sizing for the Project.

1) A 30-inch water main installed in Hawes Road from Elliot Road to the existing 30-inch stub just north of the Loop 202. Connections to this 30-inch water main must have flange isolation kits. A soil corrosion potential analysis as well as a cathodic protection analysis will also need to be performed on the transmission main.

2) Connections between the distribution system and transmission mains that are 24-inches and larger should occur at the half-mile and one-mile intervals. Additional connections may be made, however, connection points must be optimized as to minimize valves along the transmission main. For reference, 12-inch stub-outs along either side of the existing 24-inch water transmission main in Sossaman Road occur at every quarter-mile interval. Connections to transmission water mains must be a minimum of 12-inches and lateral connections to these City transmission mains will require separation by transmission main valves.

3) In regards to tapping existing large diameter transmission mains that are larger than 16-inches, of which Hawes Crossing proposed to do along the existing 30-inch transmission main in Elliot Road, the City has responded by stating *"the Approved Products List sections W-6 and W-7 provide requirements for tapping CCP waterlines if agreed to by the WR Dept. Submittals must be made to WR on the tapping sleeve and tapping contractor before construction. The coupon from the tapping operation must be provided to WR after completion."* If the City refuses the tapping request during design, the developer may alternatively parallel the transmission main with a 12-inch water main per Item #4.

4) Per the City, parallel distribution pipes (12—inch minimum diameter) must be extended across the frontage of developments adjacent to transmission mains larger than 16" *unless an acceptable internal public water loop that allows for future development connections can be agreed upon in writing with the City's Water Resources Department* (see Item #2 above). Isolation valves shall be installed at all transmission main connections and no dead-end connections shall be on transmission mains larger than 16". Dual feeds to the same transmission main must be separated by an isolation valve on the transmission main, unless otherwise approved by the City's Water Resources Department. No service taps on waterlines larger than 16" or concrete-cylinder pipes (any size) without written approval from the City's Water Resources Department.

5) The City may contribute to the upsizing of water lines that are upsized for regional uses based on the City's policies on City cost sharing at the time of design and construction. This includes the proposed 30-inch water transmission main in Hawes Road. If the City's cost sharing of the line upsizing is not available at the time of development, the City will determine how the developer should proceed with the design and construction of the main (including the potential for installation of the typical 16-inch distribution line seen in arterial streets).

6) All one-mile streets must have 16-inch water mains or larger and all half-mile streets must have 12-inch water mains.

7) A 12-inch water main loops through the Project at the approximate half-mile interval between Sossaman Road and Hawes Road and between Elliot Road and Warner Road, though the exact alignment of these half-mile water mains can snake through the development's internal street network.

As listed above in Items #1 & 2, the 30-inch water main in Hawes Road will be required of the Project by the City. This water main has not yet been constructed and HILGARTWILSON proposes that this water main have adequate connection points for development east and west of the main (ie. 12-inch stubs at all roadway intersections and/or at every quarter-mile mark, similar to the existing 24-inch water transmission main in Sossaman Road). These additional connection points will limit the excessive paralleling of the water main and add flexibility to the parcels adjacent to Hawes Road. Per discussions with the City, connections to the already existing 30-inch/42-inch water transmission main in Elliot Road will be made only at existing stubs at 80th Street and Hawes Road. Depending on the timing and pattern of development within each Village or parcel, a 12-inch water main may be installed parallel to existing transmission mains if additional connections are needed beyond the existing half-mile and one-mile stubs for proper service to the development. All connections to 30-inch/42-inch water transmission mains will have flange isolation kits. Per Items #6 and #7 above, and after discussions with the City, the 12-inch water mains required at the half-mile streets within the Project are proposed to snake through the development and vary slightly from the actual half-mile street alignments.

5.7 Water Improvements Phasing

The Project is divided into development blocks, denoted as Villages, for the purposes of development sale offerings. These Villages are anticipated to be developed in phases specific to the developers' needs and the water system infrastructure will similarly be constructed in phases as required to serve each village or village phase in the Project. As such, the offsite water infrastructure required to serve the Project will be constructed at the same time each Village or Village phase is developed. Individual parcels within specific Villages may develop individually, however, and the offsite water infrastructure required to serve that parcel will be constructed at the same time as the parcel is developed. Furthermore, the water mains that are installed in each Village, Village phase, or individual parcel will be sized for build-out conditions, will provide adequate looping in the water system (i.e. two points of connection), and will meet the required fire flows for the area that is developed.

6.0 DEVELOPMENT VILLAGES

6.1 Definition

Villages shall exclusively mean development areas within the Hawes Crossing project boundary and are delineated numerically (1-8) on the subject Master Plans. The numerical value associated with a Village is not an indication or obligation of sequential phasing or development. Villages, or portions thereof, may develop independently from one another but with primary infrastructure in accordance with the associated Master Plan documents. Infrastructure shall be as outlined in the approved Master Plan documents, or an approved amendment to those documents. Interim or alternative solutions may be allowed on a case by case basis, subject to City of Mesa review and approval.

6.2 Overview

The Project is planned to be divided into eight development villages. Villages 1 – 5 consist of all the land within the Project that is not currently owned by the State. Villages 6 – 8 are State Land owned. Each Village has different water infrastructure requirements for serving that particular Village and the following sections detail these requirements. Note that some Villages will be sharing the cost of certain lengths of pipe and associated infrastructure outlined in the following sections. The infrastructure shown as being required to serve each village is based on the City required build-out infrastructure shown on Figure 5 in Appendix A and is quantified as the necessary infrastructure to serve that village as a stand-alone unit. The water mains shown in Figures 7 through 14 in Appendix A show only the infrastructure in right-of-way and/or infrastructure required to adequately provide two points of connection to the village. A summary of the necessary water infrastructure for serving each village is provided in Table 4 below. Figure 3 in Appendix A outlines the village boundaries.

TABLE 4
REQUIRED WATER INFRASTRUCTURE BY VILLAGE

Village	Length of Pipe (feet)			
	8-inch	12-inch	16-inch	30-inch
1	2,770	5,341	1,975	0
2	6,237	5,955	0	2,626
3	0	693	2,893	0
4	665	271	5,296	906
5	300	3,229	5,296	2,270
6 (State Land)	7,075	7,254	5,296	3,554
7 (State Land)	0	3,727	0	6,181
8 (State Land)	1,604	12,975	0	0

6.3 Village 1

Village 1 consists of parcels A-1, A-2, B-1 through B-6, C-1, and D-1. Village 1 comprises approximately 110.5 acres of the overall Project area. The required water

infrastructure for serving Village 1 includes a 12-inch water main in 80th Street, south from Paloma Avenue along the Project frontage. A 12-inch water main will be installed through the development in lieu of the City required 12-inch water main in Paloma Drive between 80th Street and Hawes Road. A 16-inch water main is to be installed in Hawes Road from the Peralta Avenue alignment south to extend along the Hawes Road frontage of Village 1 and is anticipated to be cost shared with Village 3. A 12-inch water main extends north between Parcel D-1 and D-2 from the existing 30-inch transmission main in Elliot Road, which will share costs between Villages 1 and 3. Connection to this 30-inch transmission main will only be allowed with specific approval from the City's Water Resources Department and, if such approval is not granted, the development of Village 1 will require a 12-inch water main extended parallel to the 30-inch transmission main from 80th Street. Looped 8-inch water mains will be required within most streets of Village 1 as per the conceptual roadway alignments shown on Figure 2 in Appendix A. The necessary water infrastructure for serving Village 1 of the Project is shown on Figure 7 in Appendix A.

6.4 Village 2

Village 2 consists of parcels A-3 through A-5 (approximately 60% of each parcel), B-7 – B-14, approximately 50% of parcel B-15, C-2, C-3, C-4, and D-3 through D-6. Village 2 comprises approximately 247.0 acres of the overall Project area. The required water infrastructure for serving Village 2 includes a 30-inch water main in Hawes Road for approximately 2,626 LF south of Elliot Road to cover the entire Hawes Road frontage of Village 2. This 30-inch water main will have cost sharing with Village 7. Approximately 5,955 LF of 12-inch water main will also run through Village 2 along the 80th Street alignment as well as the frontage of the mixed-use parcels D-3 – D-6. Approximately 6,237 LF of 8-inch water main will be required within the streets of Village 2 as per the conceptual roadway alignments shown on Figure 2 in Appendix A. The necessary water infrastructure for serving Village 2 of the Project is shown on Figure 8 in Appendix A.

6.5 Village 3

Village 3 consists of parcel D-2. Village 3 comprises approximately 21.2 acres of the overall Project area. The required infrastructure for serving Village 3 includes a 16-inch water main to be installed in Hawes Road from Elliot Road to the existing 12-inch water main just north of Paloma Avenue. A portion of this 16-inch water main is anticipated to be cost shared with Village 1. A 12-inch water main extends north between Parcel D-1 and D-2 from the existing 30-inch transmission main in Elliot Road, which will share costs between Villages 1 and 3. Connection to this 30-inch transmission main will only be allowed with specific approval from the City's Water Resources Department and, if such approval is not granted, the development of Village 3 will require a 12-inch water main extended parallel to the 30-inch transmission main from Hawes Road. The necessary water infrastructure for serving Village 3 of the Project is shown on Figure 9 in Appendix A.

6.6 Village 4

Village 4 consists of parcels B-25 and F-4. Village 4 comprises approximately 58.6 acres of the overall Project area. The required infrastructure for serving Village 4 includes 906 LF of 30-inch water main in Hawes Road from Warner Road to the

existing 30-inch stub just north of the Loop 202. The entire length of this 30-inch water main will have cost sharing with Village 5 and Village 6. A 12-inch stub-out is to be provided from the 30-inch water main in Hawes Road just north of the Loop 202. A 5,296 LF 16-inch water main in Warner Road from Sossaman Road to Hawes Road will also be required to serve Village 4. This 16-inch water main will have cost sharing with Villages 5 and 6. Approximately 665 LF of 8-inch water main will be required within the streets of Village 4 as per the conceptual roadway alignments shown on Figure 2 in Appendix A. The necessary water infrastructure for serving Village 4 of the Project is shown on Figure 10 in Appendix A.

6.7 Village 5

Village 5 consists of parcels B-21, B-23, B-24, F-3, and F-4. Village 5 comprises approximately 87.1 acres of the overall Project area. The required infrastructure for serving Village 5 includes 2,270 LF of 30-inch water main in Hawes Road from the existing 30-inch stub just north of the Loop 202 north along the entire Village 5 frontage of Hawes Road. Portions of this 30-inch water main will have cost sharing with Villages 4, 6, and 7. Additionally, 5,296 LF 16-inch water main is to be installed in Warner Road from Sossaman Road to Hawes Road. Portions of this 16-inch water main will have cost sharing with Villages 4 and 6. A 1,315 LF 12-inch water main is required in Warner Road from Hawes Road to just west of the Loop 202. A 12-inch water main will be required to enter Village 5 from the proposed 30-inch water main in Hawes Road between Parcels B-21 and B-23. A second 12-inch water main stub will also be required to extend into Parcel F-5 from the 30-inch transmission main in Hawes Road. Approximately 300 LF of 8-inch water main will be required within the streets of Village 5 as per the conceptual roadway alignments shown on Figure 2 in Appendix A. The necessary water infrastructure for serving Village 5 of the Project is shown on Figure 11 in Appendix A.

6.8 Village 6 (State Land Property)

Village 6 consists of approximately 40% of parcels A-3 through A-5, approximately 50% of B-15, B-16 through B-20, B-22, C-5, C-6, F-2, and G-1. Village 6 comprises approximately 164.9 acres of the overall Project area. The required infrastructure for serving Village 6 includes 3,554 LF of 30-inch water main in Hawes Road from the stub just north of the Loop 202 to the northeast corner of Village 6 along the Hawes Road frontage of Village 6. Portions of this 30-inch water main will have cost sharing with Villages 4, 5, and 7. A 5,296 LF 16-inch water main in Warner Road from Sossaman Road to Hawes Road will also be required to serve Village 6. This 16-inch water main will have cost sharing with Villages 4 and 5. Approximately 7,075 LF of 8-inch water main and 7,254 LF of 12-inch water main will be required within the streets of Village 6 as per the conceptual roadway alignments shown on Figure 2 in Appendix A. The necessary water infrastructure for serving Village 6 of the Project is shown on Figure 12 in Appendix A.

6.9 Village 7 (State Land Property)

Village 7 consists of parcels D-7, D-8, E-1, and F-1. Village 7 comprises approximately 155.5 acres of the overall Project area. The required infrastructure for serving Village 7 includes 6,181 LF of 30-inch water main in Hawes Road from Elliot Road south to the existing stub just north of the Loop 202. Portions of this 30-inch water main will

have cost sharing with Villages 2, 4, 5, and 6. Approximately 3,727 LF of 12-inch water main will be required within the streets of Village 7 as per the conceptual roadway alignments shown on Figure 2 in Appendix A. The necessary water infrastructure for serving Village 7 of the Project is shown on Figure 13 in Appendix A.

6.10 Village 8 (State Land Property)

Village 8 consists of D-9 through D-11, E-2 through E-9, and F-6 through F-8. Village 8 comprises approximately 291.5 acres of the overall Project area. The required infrastructure for serving Village 8 includes a 1,245 LF 12-inch water main in Elliot Road from the existing 12-inch water main in Elliot Road, west, to the existing 16-inch water main underneath the Loop 202. Approximately 1,604 LF of 8-inch water main and 11,730 LF of 12-inch water main will be required within the streets of Village 8 as per the conceptual roadway alignments shown on Figure 2 in Appendix A. The necessary water infrastructure for serving Village 8 of the Project is shown on Figure 14 in Appendix A. Village 8 will not have any cost sharing with the rest of the Project as this portion of the Project falls entirely within the Desert Wells Service Zone.

7.0 HYDRAULIC MODEL AND RESULTS

7.1 Design Methodology

The proposed system was modeled using WaterCAD V8i by Bentley Systems, Inc. Five scenarios were modeled: average day, maximum day, peak hour, residual fire flow plus maximum day conditions, and available fire flow during maximum day conditions. A residual fire flow analysis applies the required fire flow to each corresponding junction in the system to confirm the system's ability to meet the minimum pressure and maximum velocity requirements while providing the required fire flow during maximum day conditions. The available fire flow analysis estimates the maximum flow available at each junction while maintaining the minimum allowable residual pressure throughout the proposed system during maximum day conditions. The hydraulic model included in this Master Report does not account for offsite demands and/or fire flows.

Figure 4 in Appendix A provides an overview of the minimum required proposed water system improvements for the Project that the hydraulic model is based on. Figure 6 in Appendix A provides a summary of the available fire flow at each junction within the Project for the minimum required water main sizing the Project requires. Figure 5 in Appendix A provides how the system will be constructed and operate at build-out, including all necessary City required upsizing and connection points. Water model results are not provided for the City required upsizing configuration as pressures and fire flows are anticipated to be higher, while velocities and headlosses are lower, with the increased water main sizing and additional required infrastructure.

7.1.1 Falcon Field Service Zone

A hydrant flow test was conducted along the existing 24-inch offsite water main in Sossaman Road on September 27, 2019 at 7:05 AM by EJ Flow Tests, LLC, to identify existing system pressures in the Project vicinity. The hydrant flow test was performed by flowing two hydrants along the 24-inch water main just south of Elliot

Road. The flow test results at this location show a static pressure of 79.0 psi and a residual pressure of 70.0 psi at a total flow of 2,445 gpm. The flow test results and associated pump curves for the Falcon Field Service Zone fire flow test are located in Appendix D of this report. The flow test results were used to establish the boundary conditions for the hydraulic model of the existing and proposed water infrastructure to serve the Project.

7.1.2 Desert Wells Service Zone

A hydrant flow test was conducted along the existing 16-inch offsite water main in Elliot Road on September 27, 2019 at 7:530 AM by EJ Flow Tests, LLC, to identify existing system pressures in the Project vicinity. The hydrant flow test was performed by flowing two hydrants along the 16-inch water main just east of Ellsworth Road. The flow test results at this location show a static pressure of 94.0 psi and a residual pressure of 92.0 psi at a total flow of 2,277 gpm. The flow test results and associated pump curves for the Desert Wells Service Zone fire flow test are located in Appendix D of this report. The flow test results were used to establish the boundary conditions for the hydraulic model of the existing and proposed water infrastructure to serve the Project.

7.2 Hydraulic Model Results (Falcon Field Service Zone)

Detailed hydraulic model results for the proposed Falcon Field system are provided in Appendix E. These results are based on the fire flow test conducted on the existing 24-inch water main in Sossaman Road, as discussed in Section 7.1.1. Table 5 below summarizes the results. As shown in the table and results, pressures throughout the modeled area remained between 47.1 psi and 81.1 psi for the domestic scenarios modeled. Velocities and head losses for the peak hour scenario fall within the allowable limits shown in Table 1. Furthermore, the fire flow analysis showed that the proposed system can adequately provide the required 1,500 gpm residential fire flow and the 3,000 gpm commercial/industrial fire flow to the Project while maintaining a residual pressure of at least 20 psi and a maximum velocity of less than 10 feet per second. Junction J-108 is shown to drop slightly below the residual pressure requirement of 20.0 psi during the residual fire flow test. Similarly, J-108 shows an available fire flows of 2,917 gpm. This Junction, located in the southeast corner of the Falcon Field portion of the Project (Parcel F-3), is anticipated to meet the City's fire flow requirements in full as additional internal looped pipe networks are added in the preliminary and final design. Furthermore, this junction meets the City's fire flow requirements based on the City required water main sizing criteria shown on Figure 5 in Appendix A.

TABLE 5
HYDRAULIC MODELING SUMMARY – FALCON FIELD SERVICE ZONE

	Average Day		Maximum Day		Peak Hour	
	Value	Location	Value	Location	Value	Location
Minimum Pressure (psi)	58.8	J-6	54.2	J-6	47.3	J-6
Maximum Pressure (psi)	81.2	J-35	76.6	J-35	69.8	J-35
Maximum Velocity (fps)	0.94	P-56, P-58	1.79	P-56, P-58	2.65	P-58
Maximum Head loss (feet/1,000 feet of pipe)	0.329	P-58	1.085	P-58	2.229	P-58

Maximum Day Demand + Fire Flow - Residual			
	Value	Location	Fire Flow Location and Flow
Minimum Residual Pressure (psi)	18.4	J-108	J-108 @ 3,000 GPM
Maximum Velocity (fps)	9.58	P-18	J-18 @ 1,500 GPM

Maximum Day Demand + Fire Flow - Available		
	Value	Location
Minimum Available Fire Flow - Residential (gpm)	1,567	J-18
Minimum Available Fire Flow - Commercial (gpm)	2,917	J-108

Notes:
* Full model results are provided in Appendix E.

7.3 Hydraulic Model Results (Desert Wells Service Zone)

Detailed hydraulic model results for the proposed Desert Wells system are provided in Appendix F. These results are based on the fire flow test conducted on the existing 16-inch water main in Elliot Road, as discussed in Section 7.1.2. Table 6 below summarizes the results. As shown in the table and results, pressures throughout the modeled area remained between 92.4 psi and 104.0 psi for the domestic scenarios modeled. Velocities and head losses for the peak hour scenario fall within the allowable limits shown in Table 1. Furthermore, the fire flow analysis showed that the proposed system can adequately provide the required 3,000 gpm of commercial/industrial fire flow to the Project while maintaining a residual pressure of at least 20 psi and a maximum velocity of less than 10 feet per second.

TABLE 6
HYDRAULIC MODELING SUMMARY – DESERT WELLS SERVICE ZONE

	Average Day		Maximum Day		Peak Hour	
	Value	Location	Value	Location	Value	Location
Minimum Pressure (psi)	92.6	J-506	92.6	J-506	92.4	J-506
Maximum Pressure (psi)	104.0	J-519	103.8	J-519	103.6	J-519
Maximum Velocity (fps)	0.44	P-505	0.82	P-505	1.20	P-505
Maximum Head loss (feet/1,000 feet of pipe)	0.058	P-505	0.182	P-505	0.366	P-505

Maximum Day Demand + Fire Flow - Residual			
	Value	Location	Fire Flow Location and Flow
Minimum Residual Pressure (psi)	79.2	J-519	J-519 @ 3,000 GPM
Maximum Velocity (fps)	8.59	P-518	J-519 @ 3,000 GPM

Maximum Day Demand + Fire Flow - Available		
	Value	Location
Minimum Available Fire Flow - Commercial (gpm)	3,497	J-519

Notes:
* Full model results are provided in Appendix F.

8.0 CONCLUSIONS

The proposed water system will adequately serve the Project. This report has determined that:

- The average day, maximum day, and peak hour demands anticipated for the Falcon Field portion of the Project are 1,576,340 gpd (1,094.7gpm), 2,981,080 gpd (2,070.2 gpm), and 4,385,820 gpd (3,045.7 gpm), respectively.
- The average day, maximum day, and peak hour demands anticipated for the Desert Wells portion of the Project are 397,202 gpd (275.8 gpm), 738,524 gpd (512.9 gpm), and 1,079,846 gpd (749.9 gpm), respectively.
- The hydraulic model shows that the Project can be adequately served by the proposed system of 8-inch and 12-inch water mains, with connections to the existing 12-inch, 16-inch, 20-inch, 24-inch, 30-inch, and 42-inch water mains. The hydraulic model included in this Master Report does not account for offsite demands and/or fire flows.
- The City will require specific water mains to be added and/or upsized from those shown in Figure 4 in Appendix A and those that the hydraulic model is based on. City required infrastructure upsizing is summarized in Section 5.6 of this report and shown on Figure 5 in Appendix A.

- Hydraulic model results show that pressures, velocities, and head losses for the proposed system fall within the allowable limits established by the City of Mesa during the domestic scenarios modeled.
- The proposed water system can provide the required 1,500 gpm residential and 3,000 gpm commercial fire flow while maintaining the minimum required residual pressure of 20 psi for both the Falcon Field and Desert Wells portions of the Project.
- The hydrant flow test results and available pumping capacity in the system will be further evaluated during the preliminary design stage to confirm adequate pumping capacity is available to serve the Project's domestic demands and fire flows.

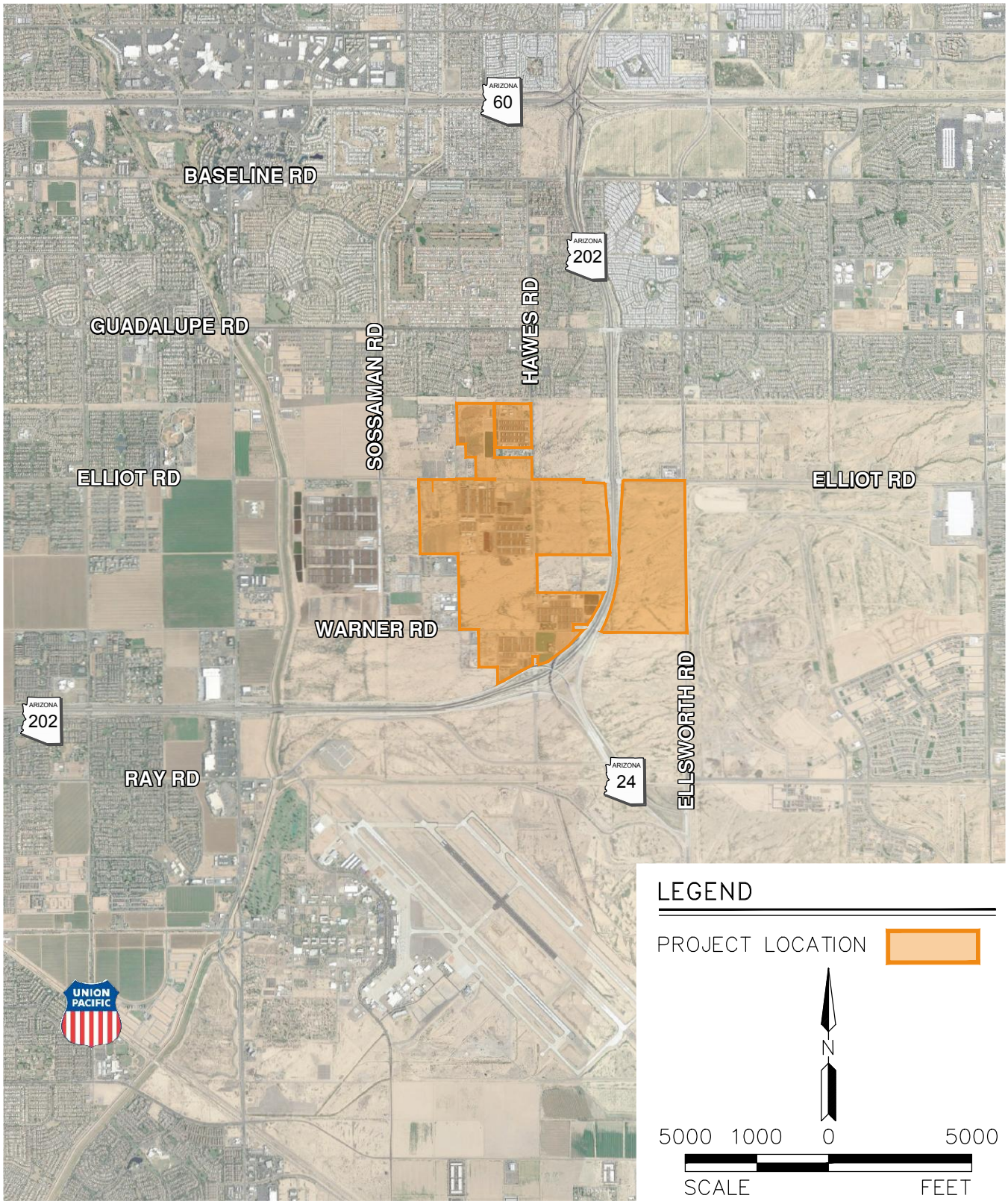
9.0 REFERENCES

City of Mesa. (2019). *Engineering Procedure Manual: 2019 Engineering & Design Standards*. 2019, Mesa, AZ

Greey Pickett. (2019). *Mesa Urban Development - Conceptual Land Use Master Plan*. (September, 2019). Phoenix, AZ

APPENDIX A

FIGURES



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DATE:	MAR 2019
SCALE:	1" = 5,000'
DRAWN BY:	MAJ
CHECKED BY:	AT

HAWES CROSSING

ELLIOT RD & LOOP 202
MARICOPA COUNTY, ARIZONA

FIG 1: VICINITY MAP

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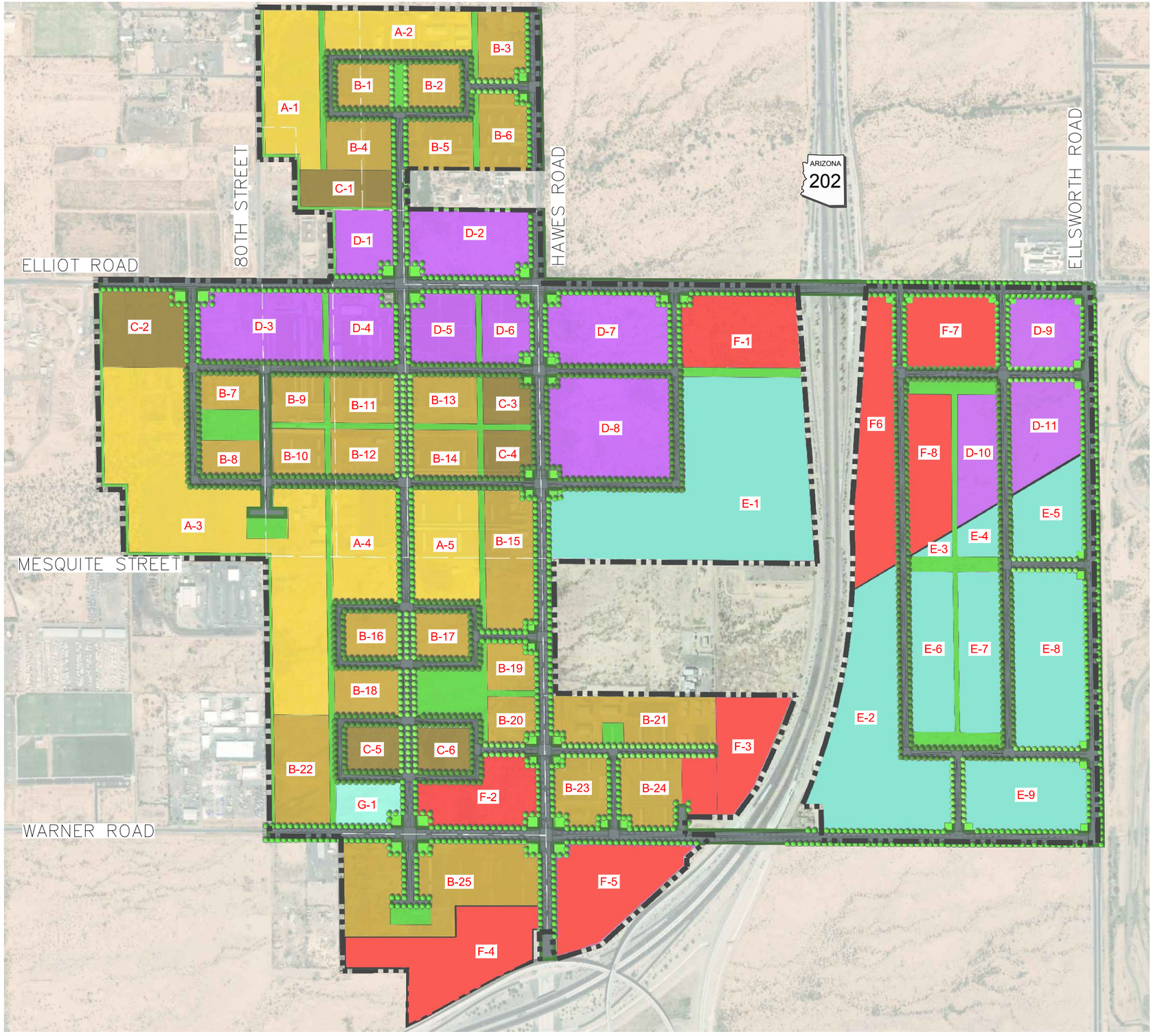

LEGEND

PROJECT BOUNDARY

ZONING CATEGORIES

A	RS-6 & RSL-4.0
B	RSL-2.5
C	RM-5
D	MIXED USE (MX)
E	LIGHT INDUSTRIAL (LI)
F	LIMITED COMMERCIAL (LC) & GENERAL COMMERCIAL (GC)
G	OFFICE (OC)
	PARK/OPEN SPACE
	RIGHT OF WAY/ROADWAY

NOTES

1) LAND USE PLAN PROVIDED BY GREEY-PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND IS SUBJECT TO CHANGE.
3) INDIVIDUAL PARCEL LABELING (IE. A-1, B-4, ETC.) IS NOT SEQUENTIAL FOR DEVELOPMENT AND IS USED SOLELY FOR THE PURPOSE OF DEFINING WATER DEMANDS AND WASTEWATER FLOWS BASED ON THEIR SPECIFIC ZONING CATEGORY.

N

1000 500 0 1000 2000

SCALE FEET

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PHOENIX, AZ 85016
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MESA, AZ

FIG 2: LAND USE PLAN

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DRAWN BY:	MAJ
CHECKED BY:	MI

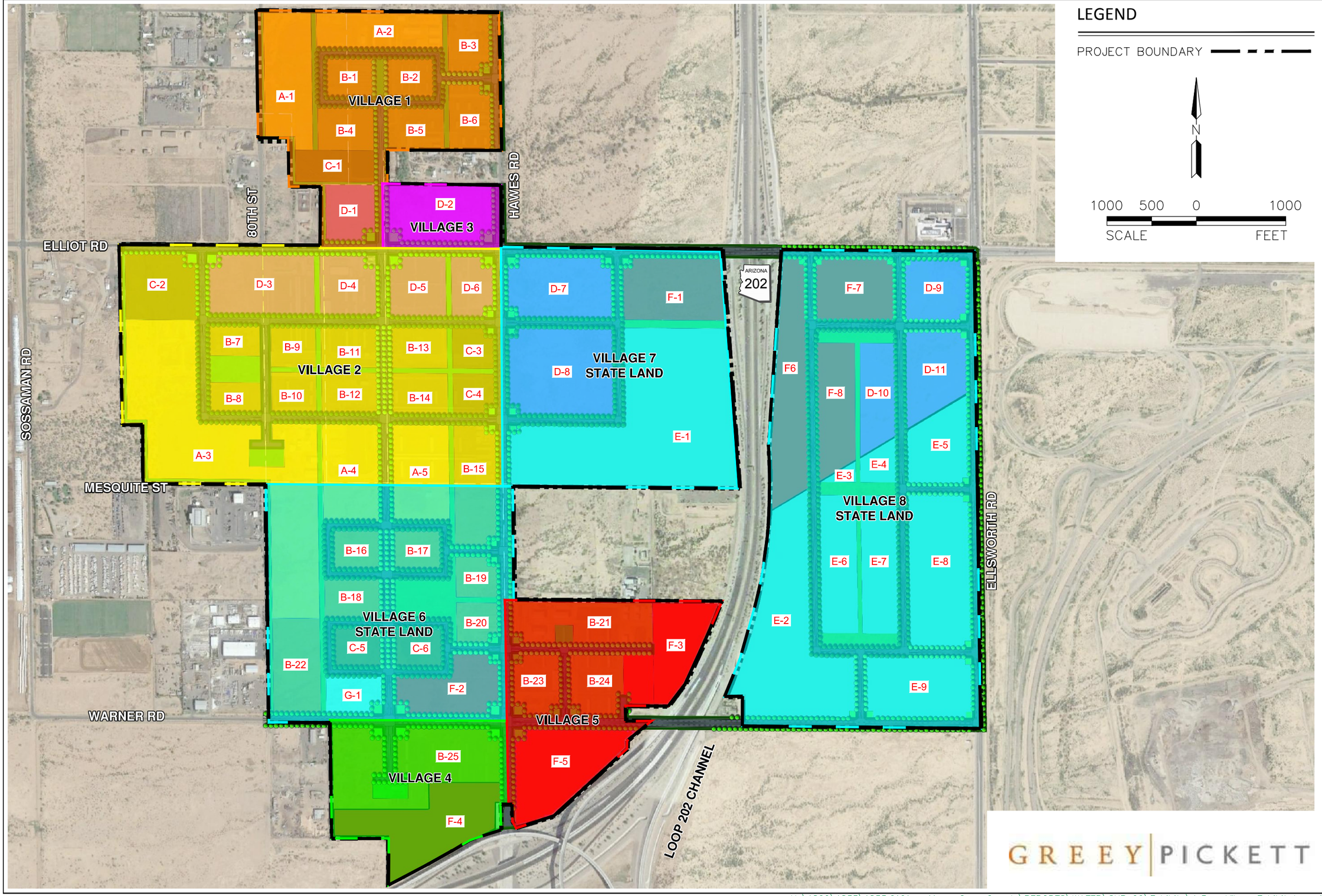

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FIG 3: VILLAGE EXHIBIT

PROJ. NO.:	1833.01
DATE:	SEP 2019
SCALE:	1" = 1,000'
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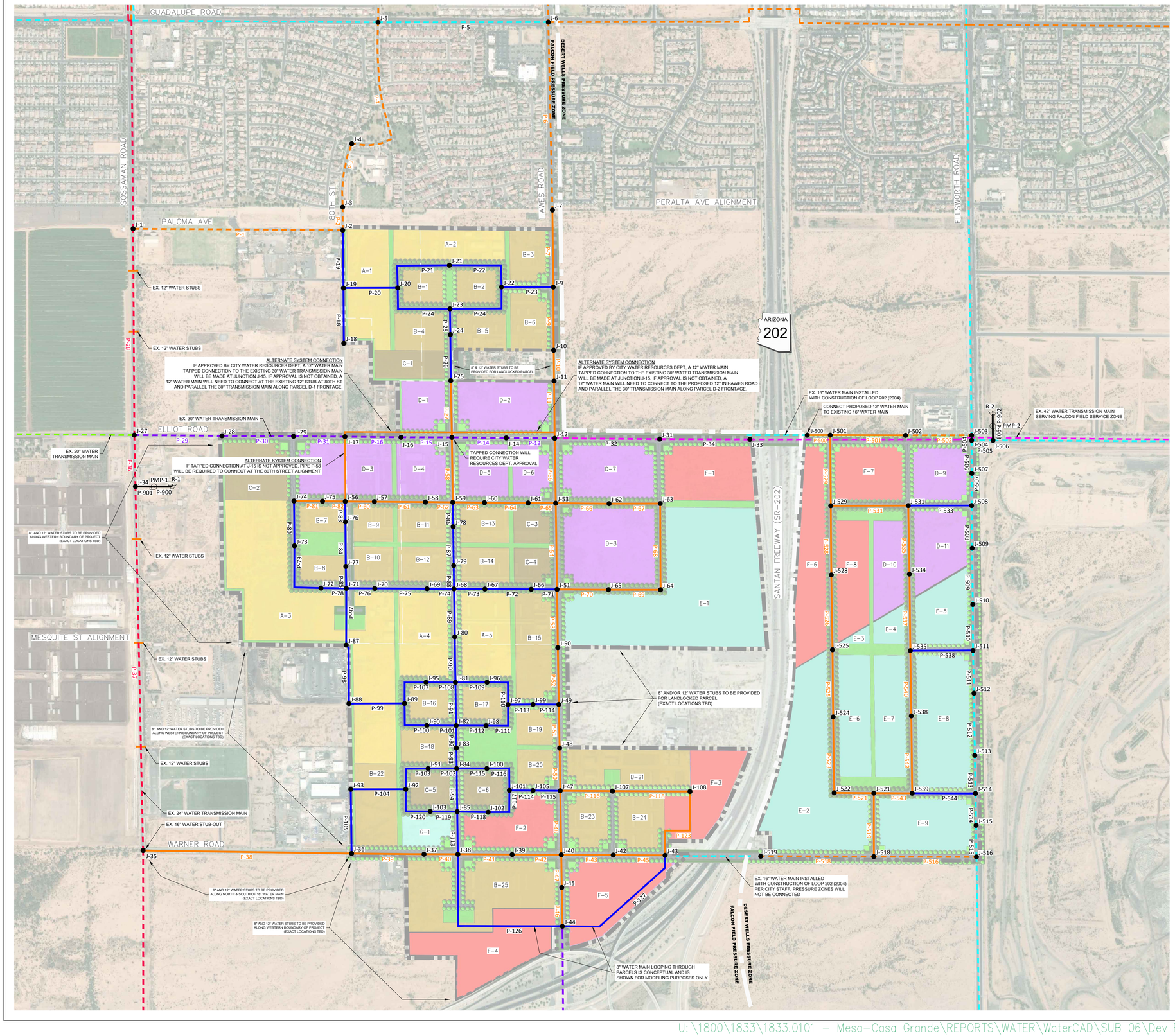

LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE
- JUNCTION
- RESERVOIR
- PUMP

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY-PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.

N

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SCALE FEET

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FIG 4: MINIMUM REQUIRED WATER SYSTEM IMPROVEMENTS

PROJ. NO.: 1833
DATE: OCT 2019
SCALE: 1"=1300'
DRAWN BY: MAJ
CHECKED BY: MI

LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE
- JUNCTION
- RESERVOIR
- PUMP

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

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3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.

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FIG 5: CITY REQUIRED WATER SYSTEM IMPROVEMENTS

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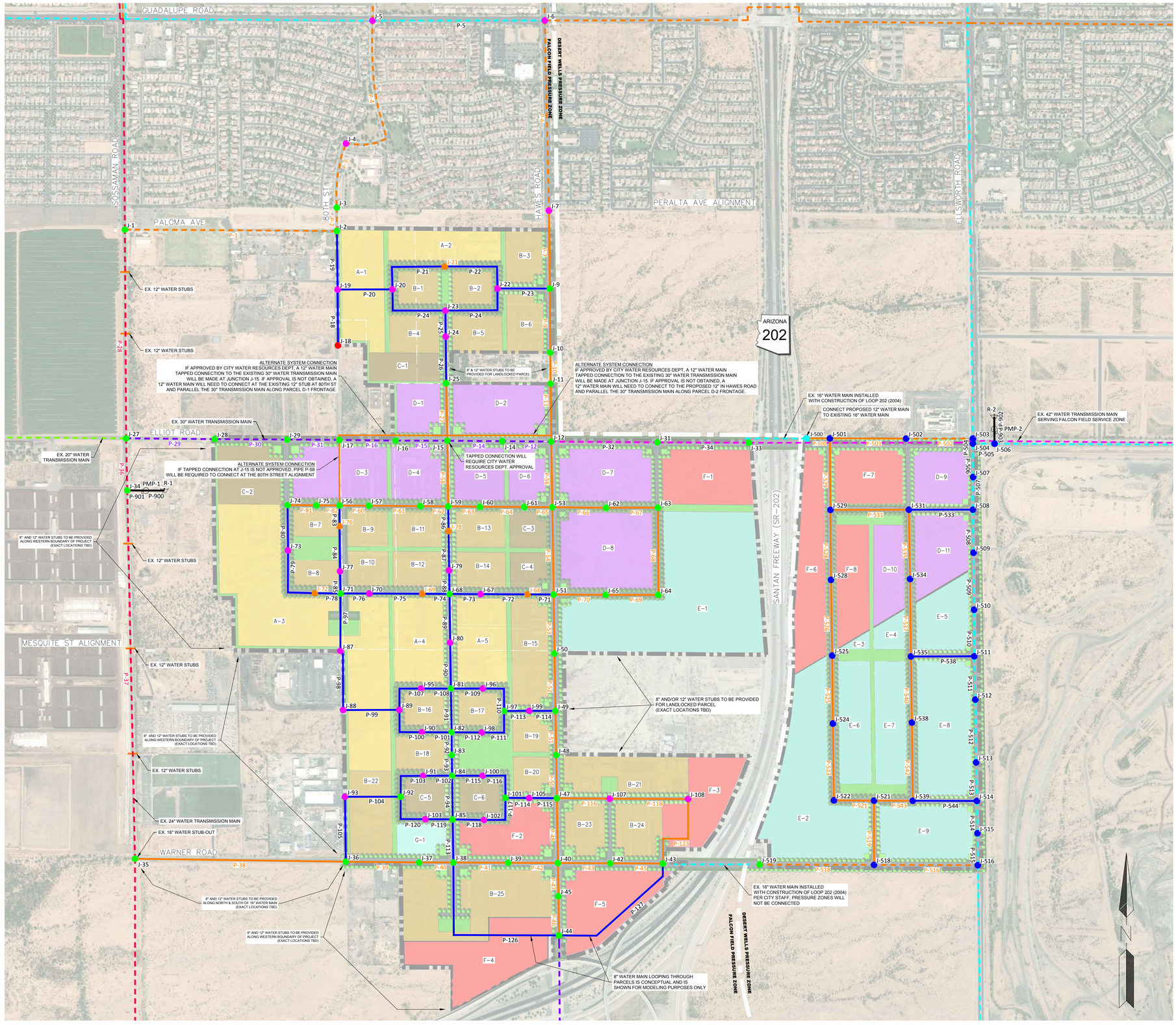

LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE
- JUNCTION
- RESERVOIR
- PUMP

PIPE DIAMETER LEGEND

	8.0 INCHES
	12.0 INCHES
	16.0 INCHES
	20.0 INCHES
	24.0 INCHES
	30.0 INCHES
	36.0 INCHES
	42.0 INCHES

AVAILABLE FIRE FLOW AT JUNCTION

- < 1,999 GPM
- 2,000 - 2,499 GPM
- 2,500 - 2,999 GPM
- 3,000 - 3,499 GPM
- 3,500 - 3,999 GPM
- > 4,000 GPM

NOTES

1) LAND USE PLAN PROVIDED BY GREEY-PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.

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MESA, AZ

FIG 6: AVAILABLE FIRE FLOWS

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DATE: OCT 2019
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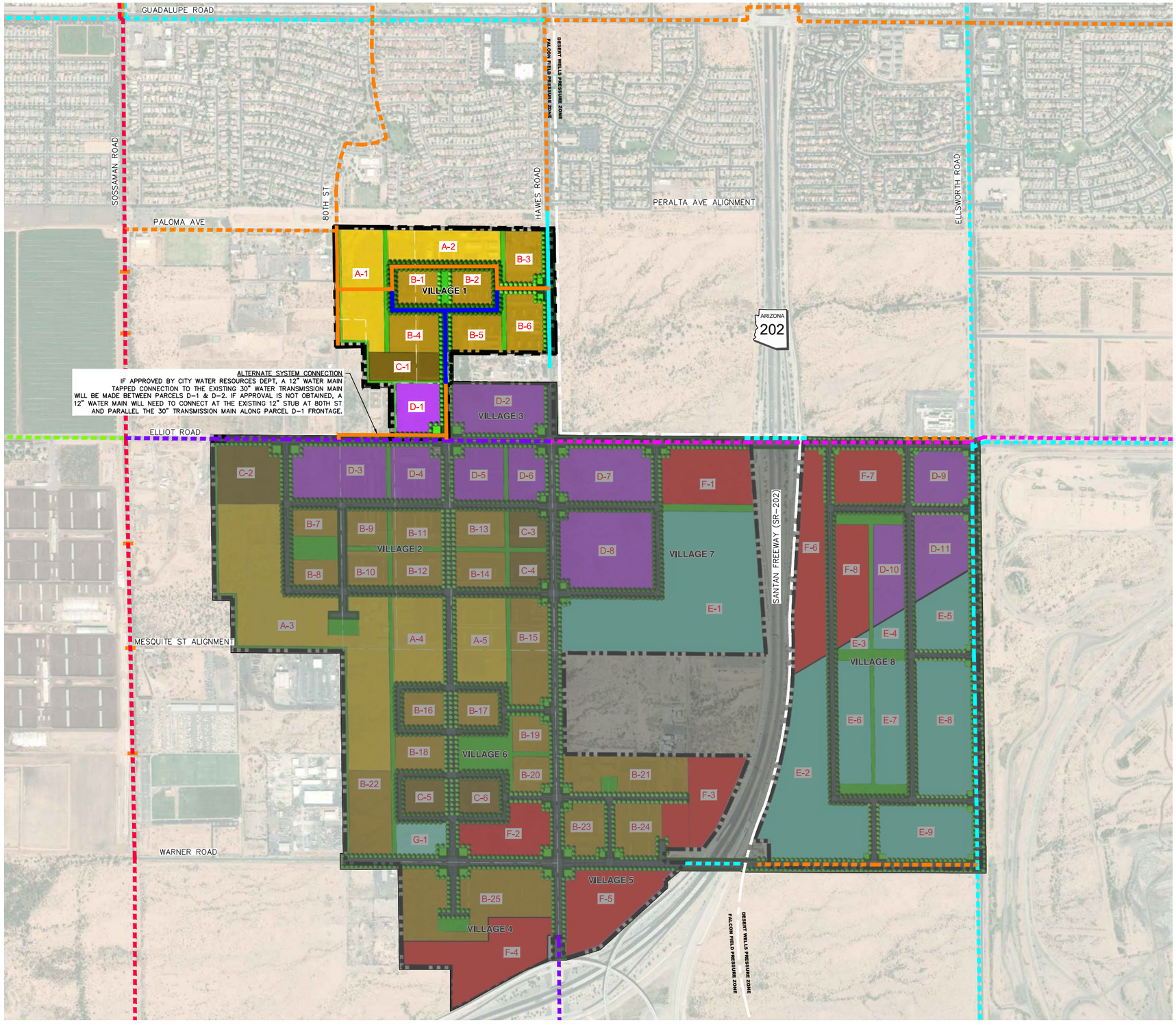

LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

N

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FIG 7 - VILLAGE 1 WATER INFRASTRUCTURE

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DATE:	OCT 2019
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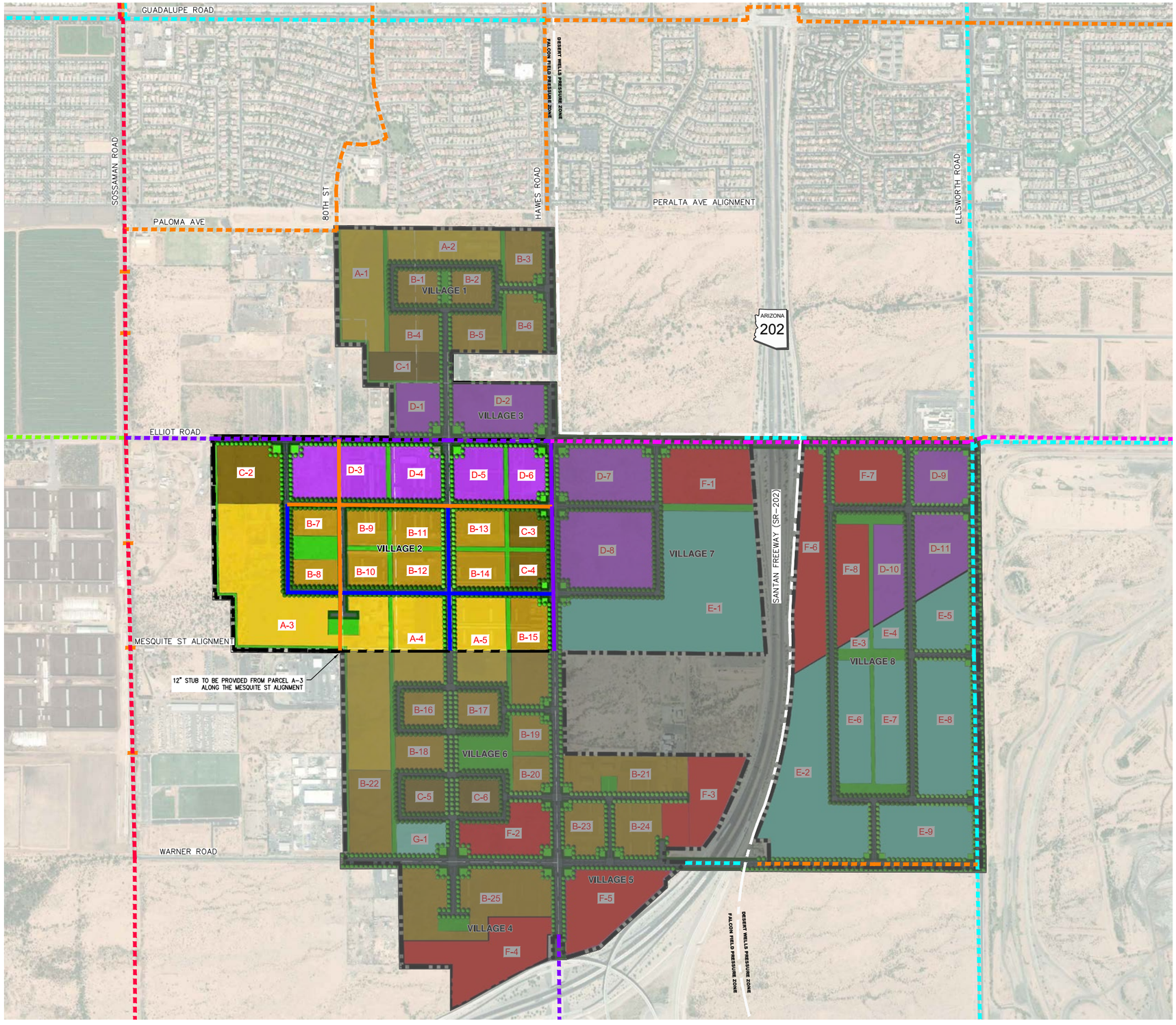

LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

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SCALE FEET

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FIG 8 - VILLAGE 2 WATER INFRASTRUCTURE

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DATE: OCT 2019
SCALE: 1"=1300'
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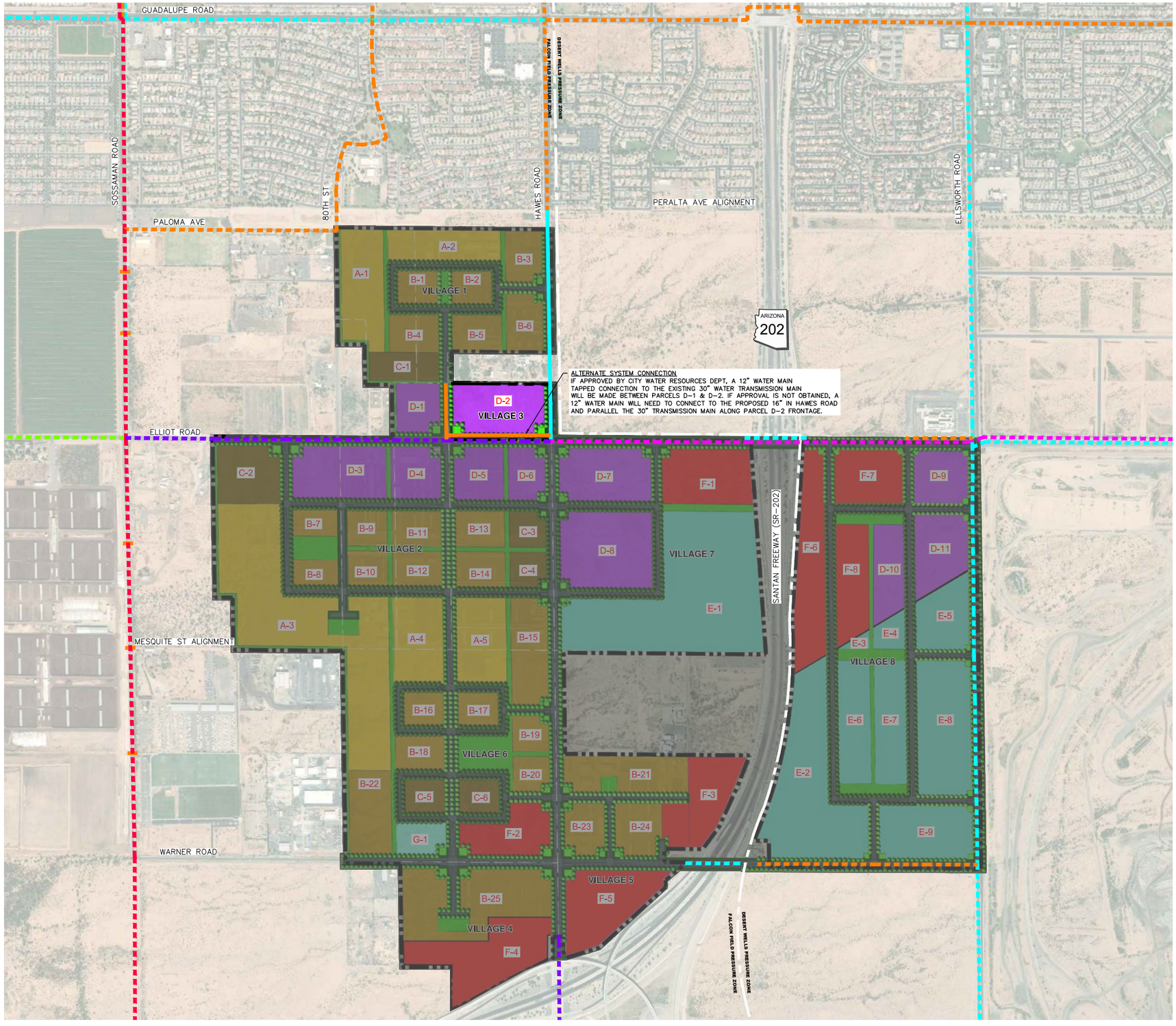


LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

N

1300 650 0 1300
SCALE FEET

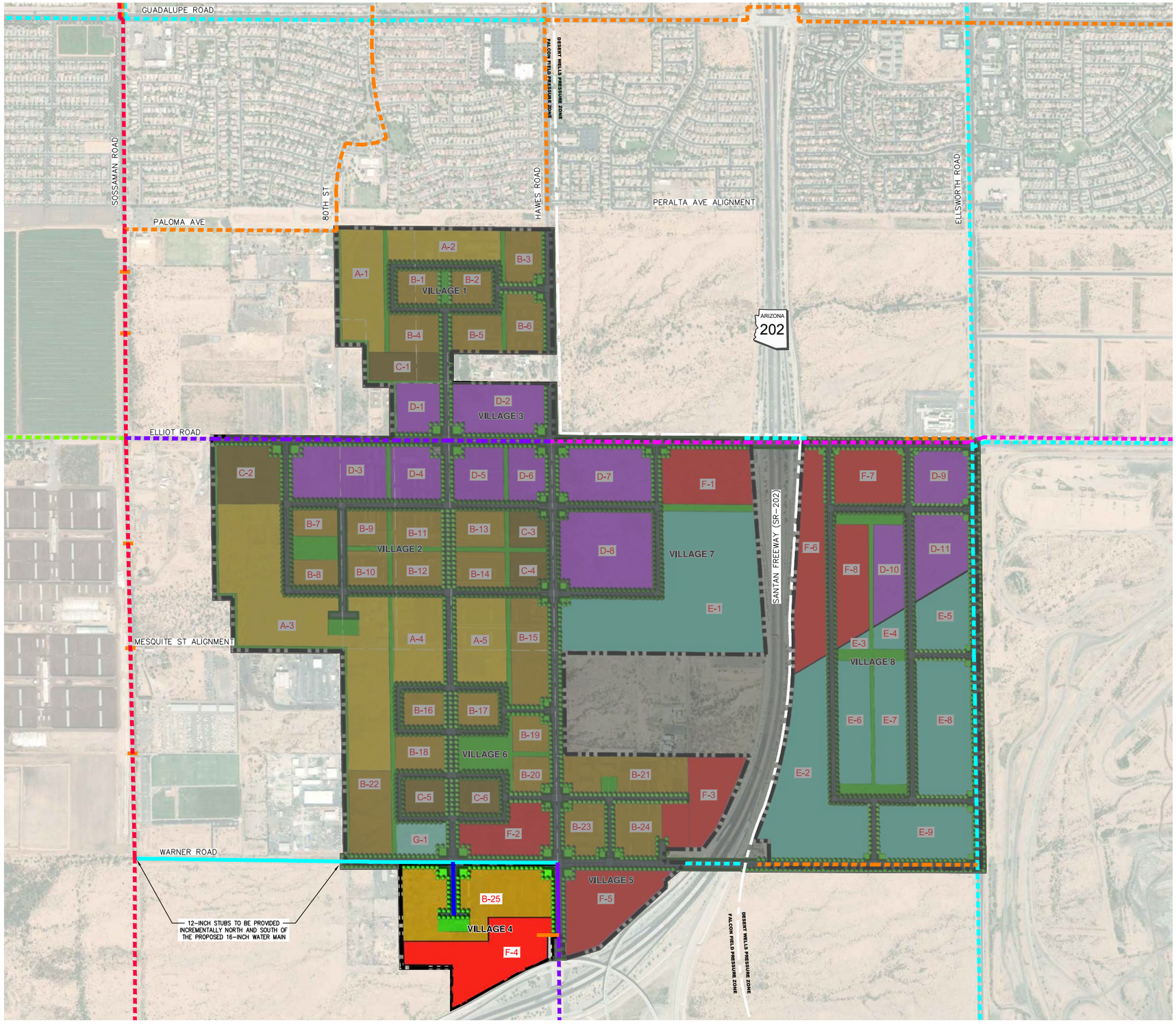
GREEY|PICKETT

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

HAWES CROSSING
ELLIOT RD & LOOP 202
MESA, AZ

FIG 9 - VILLAGE 3 WATER INFRASTRUCTURE

PROJ. NO.:	1833
DATE:	OCT 2019
SCALE:	1"=1300'
DRAWN BY:	MAJ
CHECKED BY:	MI



LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

N

1300 650 0 1300
SCALE FEET

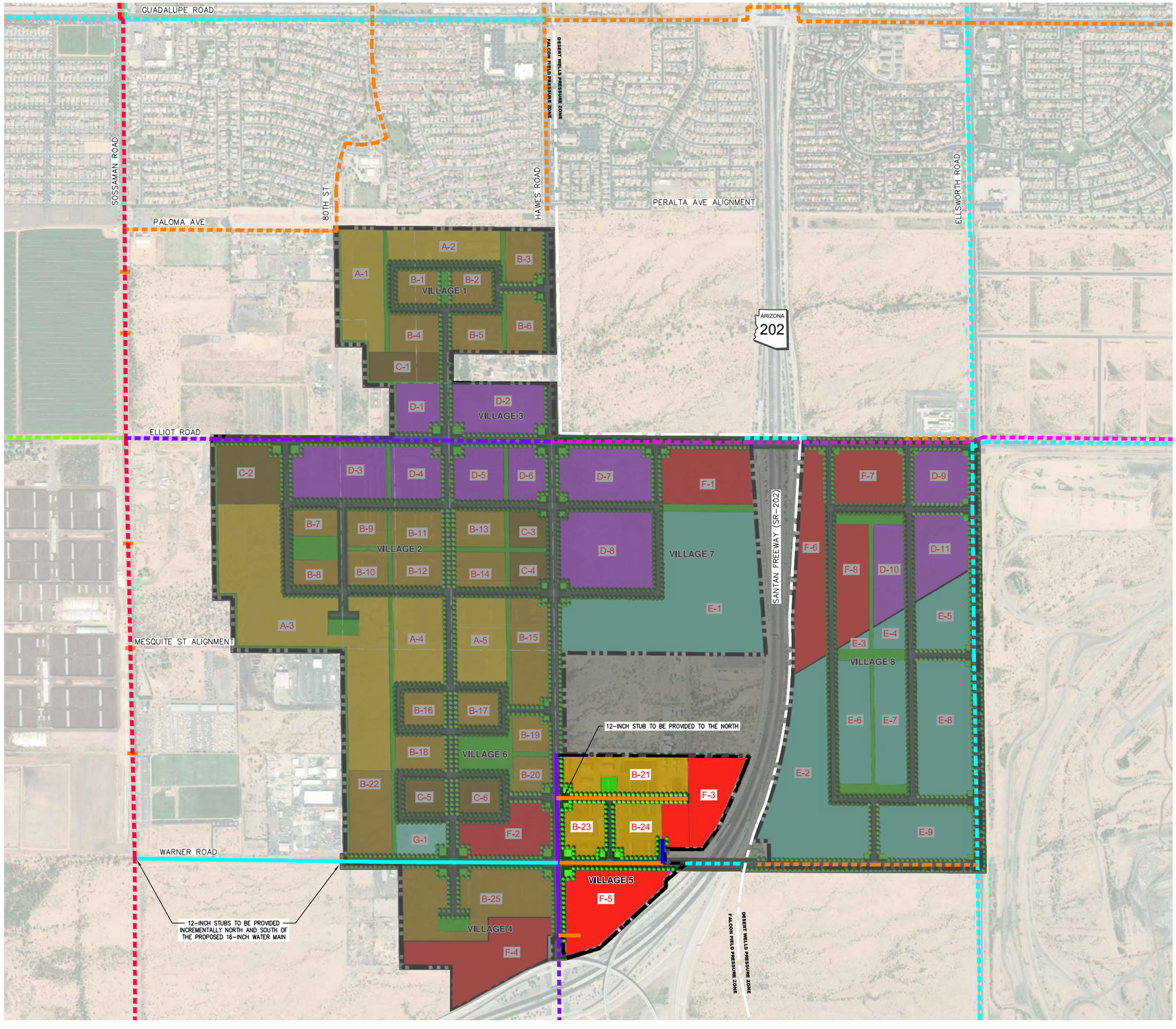
GREEY|PICKETT

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

HAWES CROSSING
ELLIOT RD & LOOP 202
MESA, AZ

FIG 10 - VILLAGE 4 WATER INFRASTRUCTURE

PROJ. NO.:	1833
DATE:	OCT 2019
SCALE:	1"=1300'
DRAWN BY:	MAJ
CHECKED BY:	MI



LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

N

1300 650 0 1300
SCALE FEET

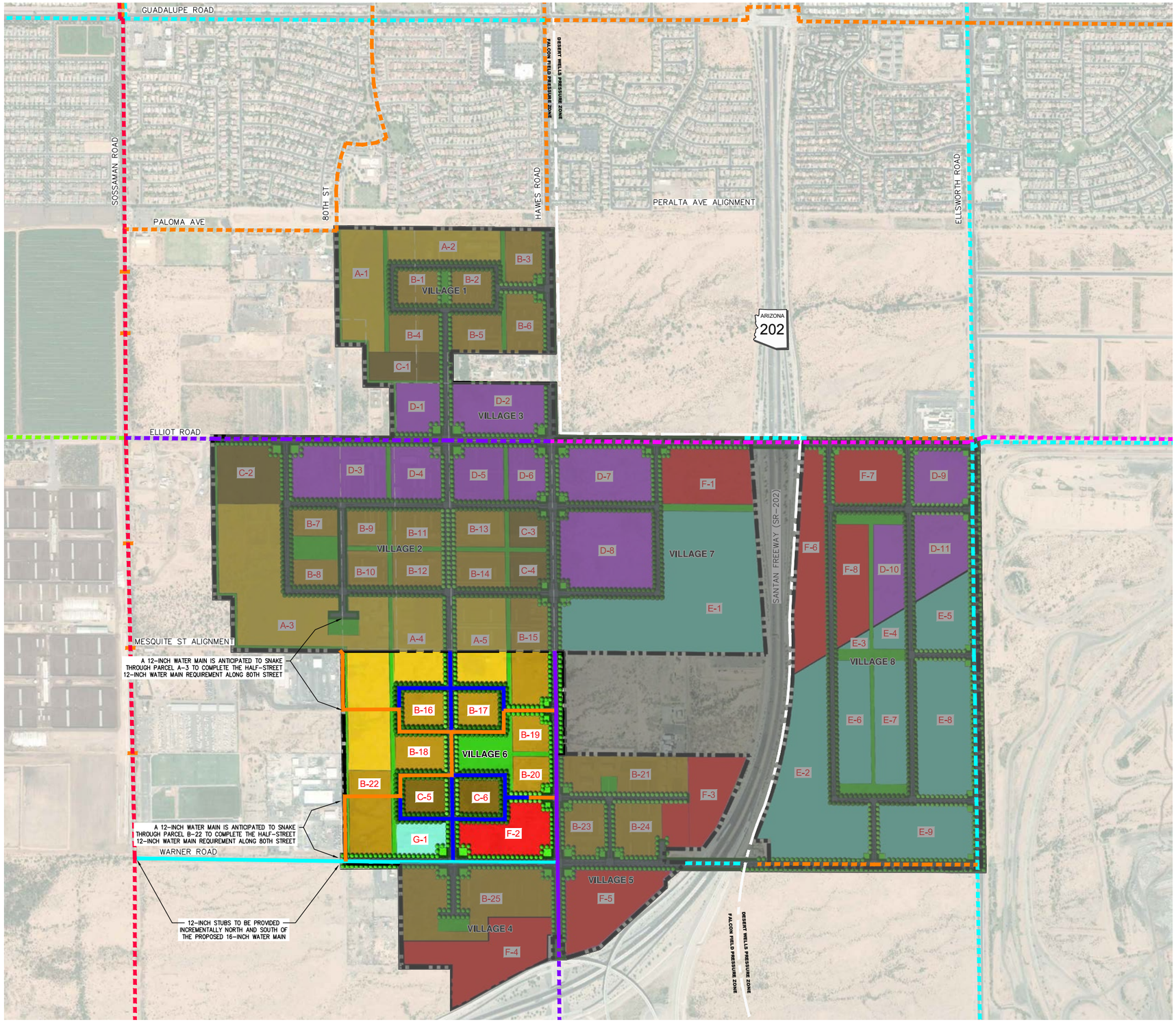
GREEY|PICKETT

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

HAWES CROSSING
ELLIOT RD & LOOP 202
MESA, AZ

FIG 11 - VILLAGE 5 WATER INFRASTRUCTURE

PROJ. NO.:	1833
DATE:	OCT 2019
SCALE:	1"=1300'
DRAWN BY:	MAJ
CHECKED BY:	MI



LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

N

1300 650 0 1300
SCALE FEET

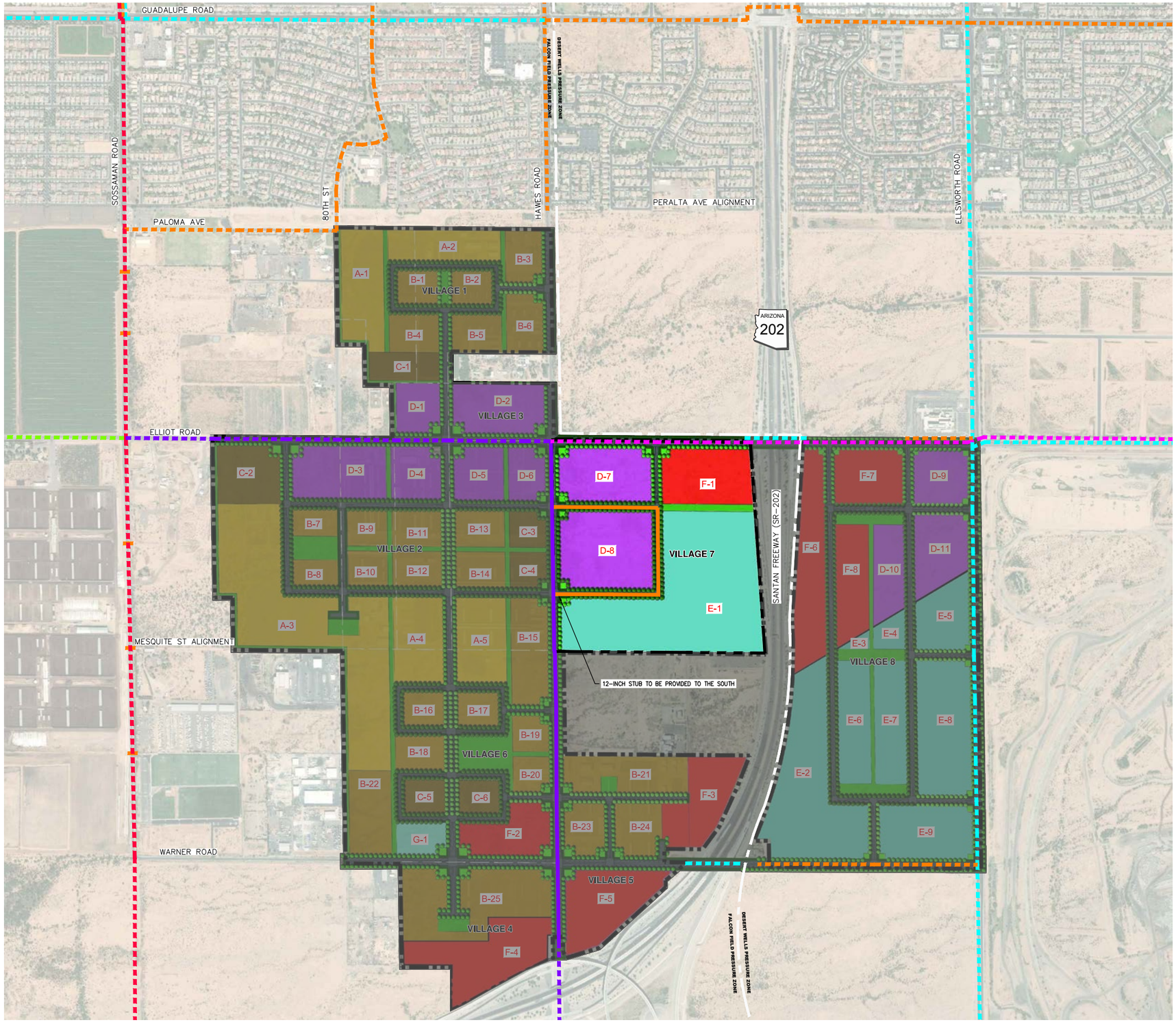
GREEY|PICKETT

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

HAWES CROSSING
ELLIOT RD & LOOP 202
MESA, AZ

FIG 12 - VILLAGE 6 WATER INFRASTRUCTURE

PROJ. NO.:	1833
DATE:	OCT 2019
SCALE:	1"=1300'
DRAWN BY:	MAJ
CHECKED BY:	MI



LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

N

1300 650 0 1300

SCALE FEET

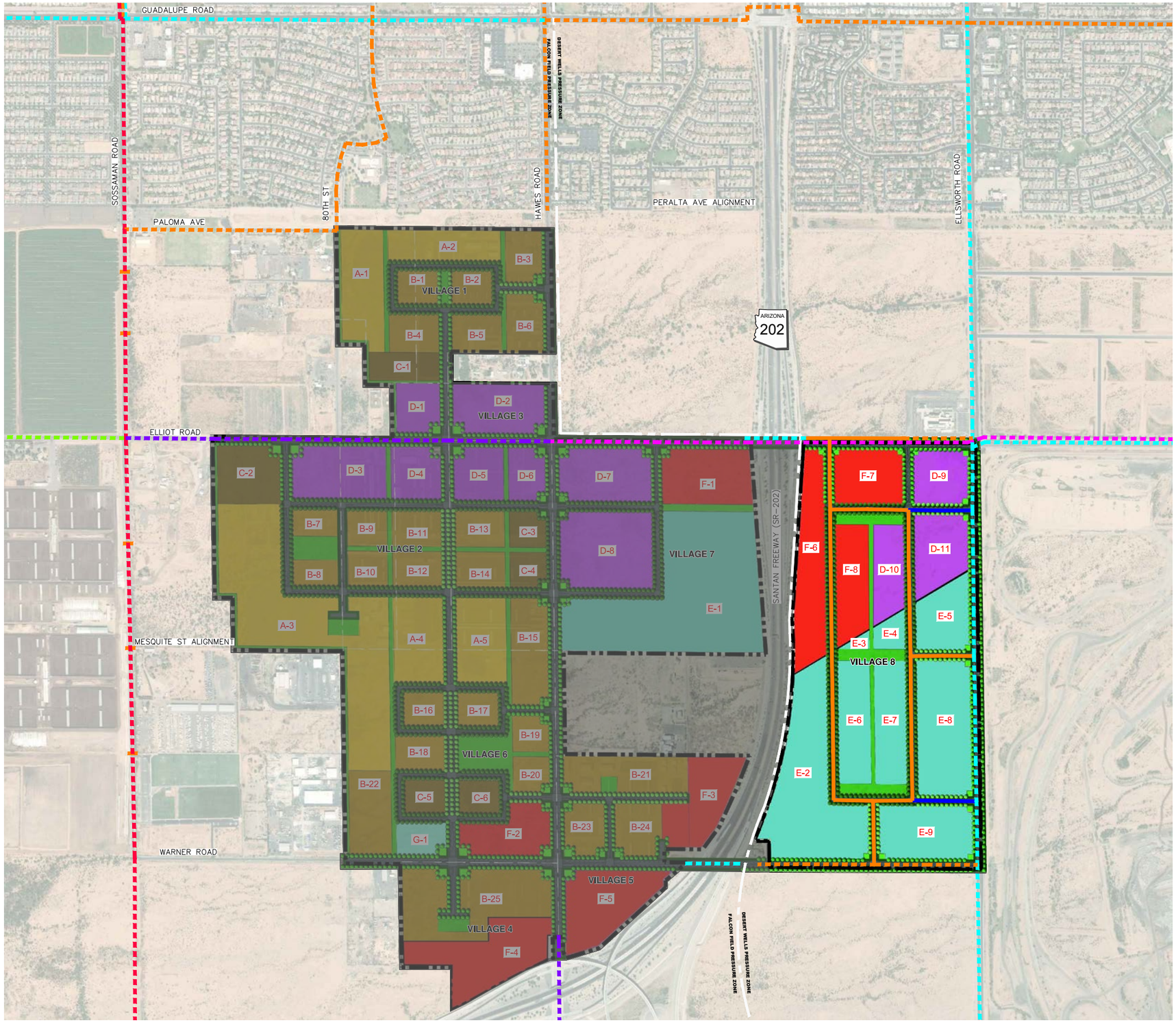
GREEY|PICKETT

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

HAWES CROSSING
ELLIOT RD & LOOP 202
MESA, AZ

FIG 13 - VILLAGE 7 WATER INFRASTRUCTURE

PROJ. NO.: 1833
DATE: OCT 2019
SCALE: 1"=1300'
DRAWN BY: MAJ
CHECKED BY: MI



LEGEND

- PROJECT BOUNDARY
- PRESSURE ZONE BOUNDARY
- VILLAGE BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE

PIPE DIAMETER LEGEND

- 8.0 INCHES
- 12.0 INCHES
- 16.0 INCHES
- 20.0 INCHES
- 24.0 INCHES
- 30.0 INCHES
- 36.0 INCHES
- 42.0 INCHES

NOTES

1) LAND USE PLAN PROVIDED BY GREEY–PICKETT.
2) LAND USE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.
3) WATER MAIN ALIGNMENTS ARE CONCEPTUAL AND SUBJECT TO CHANGE.
4) REFER TO FIGURE 5 FOR COMPLETE WATER SYSTEM IMPROVEMENTS OUTSIDE OF THE PROPOSED RIGHT–OF–WAY AREAS.

N

1300 650 0 1300

SCALE FEET

GREEY|PICKETT

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

HAWES CROSSING
ELLIOT RD & LOOP 202
MESA, AZ

FIG 14 - VILLAGE 8 WATER INFRASTRUCTURE

PROJ. NO.:	1833
DATE:	OCT 2019
SCALE:	1"=1300'
DRAWN BY:	MAJ
CHECKED BY:	MI

APPENDIX B

TABLES

Table B.1 - Water Demand Calculations

Hawes Crossing

Mesa, Arizona

October 2019

HILGARTWILSON

Calculated By: MAJ

Checked By: MI

Assigned Parcel Label	Zoning Category	Land Use[4,5]	Gross Area	Assumed Density	Assumed Dwelling Units	Commercial/Industrial Gross Area	Population	Average Day Demand		Max Day Demand		Peak Hour Demand	
			(ac)	(du)	(du/ac)	(ac)		(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)
FALCON FIELD PRESSURE ZONE													
A-1	RS-6	LMDR	17.9	5.0	90	-	288	36,000	25.0	72,000	50.0	108,000	75.0
A-2	RS-6	LMDR	13.2	5.0	66	-	211	26,400	18.3	52,800	36.7	79,200	55.0
A-3	RSL-4.0	LMDR	65.2	5.0	326	-	1043	130,400	90.6	260,800	181.1	391,200	271.7
A-4	RSL-4.0	LMDR	15.9	5.0	80	-	256	32,000	22.2	64,000	44.4	96,000	66.7
A-5	RSL-4.0	LMDR	15.9	5.0	80	-	256	32,000	22.2	64,000	44.4	96,000	66.7
B-1	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-2	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-3	RSL-2.5	MDR	7.1	10.0	71	-	192	18,034	12.5	36,068	25.0	54,102	37.6
B-4	RSL-2.5	MDR	7.1	10.0	71	-	192	18,034	12.5	36,068	25.0	54,102	37.6
B-5	RSL-2.5	MDR	7.1	10.0	71	-	192	18,034	12.5	36,068	25.0	54,102	37.6
B-6	RSL-2.5	MDR	8.1	10.0	81	-	219	20,574	14.3	41,148	28.6	61,722	42.9
B-7	RSL-2.5	MDR	4.5	10.0	45	-	122	11,430	7.9	22,860	15.9	34,290	23.8
B-8	RSL-2.5	MDR	4.5	10.0	45	-	122	11,430	7.9	22,860	15.9	34,290	23.8
B-9	RSL-2.5	MDR	5.3	10.0	53	-	143	13,462	9.3	26,924	18.7	40,386	28.0
B-10	RSL-2.5	MDR	5.3	10.0	53	-	143	13,462	9.3	26,924	18.7	40,386	28.0
B-11	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-12	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-13	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-14	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-15	RSL-2.5	MDR	14.5	10.0	145	-	392	36,830	25.6	73,660	51.2	110,490	76.7
B-16	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-17	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-18	RSL-2.5	MDR	6.5	10.0	65	-	176	16,510	11.5	33,020	22.9	49,530	34.4
B-19	RSL-2.5	MDR	4.9	10.0	49	-	132	12,446	8.6	24,892	17.3	37,338	25.9
B-20	RSL-2.5	MDR	4.9	10.0	49	-	132	12,446	8.6	24,892	17.3	37,338	25.9
B-21	RSL-2.5	MDR	21.0	10.0	210	-	567	53,340	37.0	106,680	74.1	160,020	111.1
B-22	RSL-2.5	MDR	13.2	10.0	132	-	356	33,528	23.3	67,056	46.6	100,584	69.9
B-23	RSL-2.5	MDR	7.6	10.0	76	-	205	19,304	13.4	38,608	26.8	57,912	40.2
B-24	RSL-2.5	MDR	4.8	10.0	48	-	130	12,192	8.5	24,384	16.9	36,576	25.4
B-25	RSL-2.5	MDR	28.3	10.0	283	-	764	71,882	49.9	143,764	99.8	215,646	149.8
C-1	RM-5	HDR	7.4	25.0	185	-	315	28,490	19.8	56,980	39.6	85,470	59.4
C-2	RM-5	HDR	13.7	25.0	343	-	583	52,822	36.7	105,644	73.4	158,466	110.0
C-3	RM-5	HDR	4.9	25.0	123	-	209	18,942	13.2	37,884	26.3	56,826	39.5
C-4	RM-5	HDR	4.9	25.0	123	-	209	18,942	13.2	37,884	26.3	56,826	39.5
C-5	RM-5	HDR	5.4	25.0	135	-	230	20,790	14.4	41,580	28.9	62,370	43.3
C-6	RM-5	HDR	5.4	25.0	135	-	230	20,790	14.4	41,580	28.9	62,370	43.3
D-1	MX	MIXED USE	7.9	12.0	48	4.0	96	15,312	10.6	30,624	21.3	45,936	31.9
D-2	MX	MIXED USE	16.6	12.0	100	8.3	200	31,850	22.1	63,700	44.2	95,550	66.4
D-3	MX	MIXED USE	18.6	12.0	112	9.3	224	35,678	24.8	71,356	49.6	107,034	74.3
D-4	MX	MIXED USE	9.7	12.0	59	4.9	118	18,796	13.1	37,592	26.1	56,388	39.2
D-5	MX	MIXED USE	9.7	12.0	59	4.9	118	18,796	13.1	37,592	26.1	56,388	39.2
D-6	MX	MIXED USE	7.0	12.0	42	3.5	84	13,398	9.3	26,796	18.6	40,194	27.9
D-7	MX	MIXED USE	17.9	12.0	108	9.0	216	34,452	23.9	68,904	47.9	103,356	71.8
D-8	MX	MIXED USE	26.1	12.0	157	13.1	314	50,108	34.8	100,216	69.6	150,324	104.4
E-1	LI	LIGHT INDUSTRIAL	68.9	-	-	68.9	-	103,350	71.8	206,700	143.5	310,050	215.3
F-1	LC/GC	COMMERCIAL	18.0	-	-	18.0	-	27,000	18.8	54,000	37.5	81,000	56.3
F-2	LC/GC	COMMERCIAL	13.8	-	-	13.8	-	20,700	14.4	41,400	28.8	62,100	43.1
F-3	LC/GC	COMMERCIAL	16.9	-	-	16.9	-	25,350	17.6	50,700	35.2	76,050	52.8
F-4	LC/GC	COMMERCIAL	24.4	-	-	24.4	-	36,600	25.4	73,200	50.8	109,800	76.3
F-5	LC/GC	COMMERCIAL	20.8	-	-	20.8	-	31,200	21.7	62,400	43.3	93,600	65.0
G-1	OC	OFFICE	5.8	-	-	5.8	-	8,700	6.0	17,400	12.1	26,100	18.1
PARKS/OPEN SPACE[6]			39.0	-	-	-	-	171,600	119.2	171,600	119.2	171,600	119.2
FALCON FIELD SUBTOTAL:			**694.0**	**-**	**4,402**	**225.6**	**10,683**	**1,576,340**	**1,094.7**	**2,981,080**	**2,070.2**	**4,385,820**	**3,045.7**
DESERT WELLS PRESSURE ZONE													
F-6	LC/GC	COMMERCIAL	21.2	-	-	21.2	-	31,800	22.1	63,600	44.2	95,400	66.3
F-7	LC/GC	COMMERCIAL	13.7	-	-	13.7	-	20,550	14.3	41,100	28.5	61,650	42.8
F-8	LC/GC	COMMERCIAL	13.9	-	-	13.9	-	20,850	14.5	41,700	29.0	62,550	43.4
D-9	MX	MIXED USE	10.7	12.0	65	5.4	130	20,710	14.4	41,420	28.8	62,130	43.1
D-10	MX	MIXED USE	10.6	12.0	64	5.3	128	20,366	14.1	40,732	28.3	61,098	42.4
D-11	MX	MIXED USE	14.0	12.0	84	7.0	168	26,796	18.6	53,592	37.2	80,388	55.8
E-2	LI	LIGHT INDUSTRIAL	41.0	-	-	41.0	-	61,500	42.7	123,000	85.4	184,500	128.1
E-3	LI	LIGHT INDUSTRIAL	1.2	-	-	1.2	-	1,800	1.3	3,600	2.5	5,400	3.8
E-4	LI	LIGHT INDUSTRIAL	3.7	-	-	3.7	-	5,550	3.9	11,100	7.7	16,650	11.6
E-5	LI	LIGHT INDUSTRIAL	12.6	-	-	12.6	-	18,900	13.1	37,800	26.3	56,700	39.4
E-6	LI	LIGHT INDUSTRIAL	15.0	-	-	15.0	-	22,500	15.6	45,000	31.3	67,500	46.9
E-7	LI	LIGHT INDUSTRIAL	15.0	-	-	15.0	-	22,500	15.6	45,000	31.3	67,500	46.9
E-8	LI	LIGHT INDUSTRIAL	26.6	-	-	26.6	-	39,900	27.7	79,800	55.4	119,700	83.1
E-9	LI	LIGHT INDUSTRIAL	18.4	-	-	18.4	-	27,600	19.2	55,200	38.3	82,800	57.5
PARKS/OPEN SPACE[6]			12.7	-	-	-	-	55,880	38.8	55,880	38.8	55,880	38.8
DESERT WELLS SUBTOTAL:			**230.3**	**-**	**213**	**200.0**	**426**	**397,202**	**275.8**	**738,524**	**512.9**	**1,079,846**	**749.9**
OTHER/STREETS/ETC.			207.5	-	-	-	-	-	-	-	-	-	-
GRAND TOTAL:			**1,131.8**	**-**	**4,615**	**425.6**	**11,109**	**1,973,542**	**1,370.5**	**3,719,604**	**2,583.1**	**5,465,666**	**3,795.6**

Notes:

Demand Factors:

Medium Density Residential (LDR):	420	gal/dwelling unit/day
Medium Density Residential (LMDR):	400	gal/dwelling unit/day
Medium Density Residential (MDR):	254	gal/dwelling unit/day
High Density Residential (MHDR):	194	gal/dwelling unit/day
High Density Residential (HDR):	154	gal/dwelling unit/day
High Density Condominium:	185	gal/dwelling unit/day
Commercial[3]:	1,500	gal/acre/day
Office[3]:	1,500	gal/acre/day
Industrial:	1,500	gallons/acre/day
Research and Development:	1,500	gallons/acre/day
Turf/Irrigation:	4,400	gallons/acre/day

Density:

2 - 4	du/ac
4 - 6	du/ac
6 - 10	du/ac
10 - 15	du/ac
15 +	du/ac

Population Factor:

3.0	Persons/du
3.2	Persons/du
2.7	Persons/du
2.0	Persons/du
1.7	Persons/du
1.7	Persons/du

Peaking Factors:

Maximum Day Demand:	2.0	x Average Day Demand
Peak Hour Demand:	3.0	x Average Day Demand

Fire Flow[7]:

Residential:	1,500	gpm	for 2 hours
Commercial:	3,000	gpm	for 2 hours
Industrial:	3,000	gpm	for 2 hours

(1) Demand factors from the Engineering Procedure Manual - Engineering & Design Standards (City of Mesa, 2017).
(2) Values shown include inside and outside water use.
(3) Commercial/Office demand factor averaged from surrounding towns as City of Mesa standard is determined by actual square footage of building.
(4) Mixed Use is calculated as 1/2 residential and 1/2 commercial.
(5) Light industrial is a mix of industrial, warehousing, and commercial buildings.
(6) Park/Open Space demands are not peaked as demands are anticipated to remain constant.
(7) Fire Flow assumed from City of Mesa Fire Code.

Table B.2 - Water Demand Calculations By Village

Hawes Crossing

Mesa, Arizona
October 2019

Calculated By: MAJ
Checked By: MI

Assigned Parcel Label	Zoning Category	Land Use[4,5]	Gross Area	Assumed Density	Assumed Dwelling Units	Commercial/Industrial Gross Area	Population	Average Day Demand		Max Day Demand		Peak Hour Demand	
			(ac)	(du)	(du/ac)	(ac)		(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)
FALCON FIELD PRESSURE ZONE													
VILLAGE 1													
A-1	RS-6	LMDR	17.9	5.0	90	-	288	36,000	25.0	72,000	50.0	108,000	75.0
A-2	RS-6	LMDR	13.2	5.0	66	-	211	26,400	18.3	52,800	36.7	79,200	55.0
B-1	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-2	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-3	RSL-2.5	MDR	7.1	10.0	71	-	192	18,034	12.5	36,068	25.0	54,102	37.6
B-4	RSL-2.5	MDR	7.1	10.0	71	-	192	18,034	12.5	36,068	25.0	54,102	37.6
B-5	RSL-2.5	MDR	7.1	10.0	71	-	192	18,034	12.5	36,068	25.0	54,102	37.6
B-6	RSL-2.5	MDR	8.1	10.0	81	-	219	20,574	14.3	41,148	28.6	61,722	42.9
C-1	RM-5	HDR	7.4	25.0	185	-	315	28,490	19.8	56,980	39.6	85,470	59.4
D-1	MX	MIXED USE	7.9	12.0	48	4.0	96	15,312	10.6	30,624	21.3	45,936	31.9
Village 1 Subtotal:			**86.6**	**-**	**791**	**4.0**	**1,995**	**208,310**	**144.7**	**416,620**	**289.3**	**624,930**	**434.0**
VILLAGE 2													
A-3 (60%)	RSL-4.0	LMDR	39.1	5.0	195.600	-	626	78,240	54.3	156,480	108.7	234,720	163.0
A-4 (60%)	RSL-4.0	LMDR	9.5	5.0	48.000	-	154	19,200	13.3	38,400	26.7	57,600	40.0
A-5 (60%)	RSL-4.0	LMDR	9.5	5.0	48.000	-	154	19,200	13.3	38,400	26.7	57,600	40.0
B-7	RSL-2.5	MDR	4.5	10.0	45	-	122	11,430	7.9	22,860	15.9	34,290	23.8
B-8	RSL-2.5	MDR	4.5	10.0	45	-	122	11,430	7.9	22,860	15.9	34,290	23.8
B-9	RSL-2.5	MDR	5.3	10.0	53	-	143	13,462	9.3	26,924	18.7	40,386	28.0
B-10	RSL-2.5	MDR	5.3	10.0	53	-	143	13,462	9.3	26,924	18.7	40,386	28.0
B-11	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-12	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-13	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-14	RSL-2.5	MDR	6.7	10.0	67	-	181	17,018	11.8	34,036	23.6	51,054	35.5
B-15 (50%)	RSL-2.5	MDR	7.3	10.0	72.50	-	196	18,415	12.8	36,830	25.6	55,245	38.4
C-2	RM-5	HDR	13.7	25.0	343	-	583	52,822	36.7	105,644	73.4	158,466	110.0
C-3	RM-5	HDR	4.9	25.0	123	-	209	18,942	13.2	37,884	26.3	56,826	39.5
C-4	RM-5	HDR	4.9	25.0	123	-	209	18,942	13.2	37,884	26.3	56,826	39.5
D-3	MX	MIXED USE	18.6	12.0	112	9.3	224	35,678	24.8	71,356	49.6	107,034	74.3
D-4	MX	MIXED USE	9.7	12.0	59	4.9	118	18,796	13.1	37,592	26.1	56,388	39.2
D-5	MX	MIXED USE	9.7	12.0	59	4.9	118	18,796	13.1	37,592	26.1	56,388	39.2
D-6	MX	MIXED USE	7.0	12.0	42	3.5	84	13,398	9.3	26,796	18.6	40,194	27.9
Village 2 Subtotal:			**180.4**	**-**	**1,689**	**22.6**	**3,927**	**430,285**	**298.8**	**860,570**	**597.6**	**1,290,855**	**896.4**
VILLAGE 3													
D-2	MX	MIXED USE	16.6	12.0	100	8.3	200	31,850	22.1	63,700	44.2	95,550	66.4
Village 3 Subtotal:			**16.6**	**12.0**	**100**	**8.3**	**200**	**31,850**	**22.1**	**63,700**	**44.2**	**95,550**	**66.4**
VILLAGE 4													
B-25	RSL-2.5	MDR	28.3	10.0	283	-	764	71,882	49.9	143,764	99.8	215,646	149.8
F-4	LC/GC	COMMERCIAL	24.4	-	-	24.4	-	36,600	25.4	73,200	50.8	109,800	76.3
Village 4 Subtotal:			**52.7**	**-**	**283**	**24.4**	**764**	**108,482**	**75.3**	**216,964**	**150.7**	**325,446**	**226.0**
VILLAGE 5													
B-21	RSL-2.5	MDR	21.0	10.0	210	-	567	53,340	37.0	106,680	74.1	160,020	111.1
B-23	RSL-2.5	MDR	7.6	10.0	76	-	205	19,304	13.4	38,608	26.8	57,912	40.2
B-24	RSL-2.5	MDR	4.8	10.0	48	-	130	12,192	8.5	24,384	16.9	36,576	25.4
F-3	LC/GC	COMMERCIAL	16.9	-	-	16.9	-	25,350	17.6	50,700	35.2	76,050	52.8
F-5	LC/GC	COMMERCIAL	20.8	-	-	20.8	-	31,200	21.7	62,400	43.3	93,600	65.0
Village 5 Subtotal:			**71.1**	**-**	**334**	**37.7**	**902**	**141,386**	**98.2**	**282,772**	**196.4**	**424,158**	**294.6**
VILLAGE 6 (State Land)													
A-3 (40%)	RSL-4.0	LMDR	26.1	5.0	130.40	-	417	52,160	36.2	104,320	72.4	156,480	108.7
A-4 (40%)	RSL-4.0	LMDR	6.4	5.0	32.00	-	102	12,800	8.9	25,600	17.8	38,400	26.7
A-5 (40%)	RSL-4.0	LMDR	6.4	5.0	32.00	-	102	12,800	8.9	25,600	17.8	38,400	26.7
B-15 (50%)	RSL-2.5	MDR	7.3	10.0	72.50	-	196	18,415	12.8	36,830	25.6	55,245	38.4
B-16	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-17	RSL-2.5	MDR	5.4	10.0	54	-	146	13,716	9.5	27,432	19.1	41,148	28.6
B-18	RSL-2.5	MDR	6.5	10.0	65	-	176	16,510	11.5	33,020	22.9	49,530	34.4
B-19	RSL-2.5	MDR	4.9	10.0	49	-	132	12,446	8.6	24,892	17.3	37,338	25.9
B-20	RSL-2.5	MDR	4.9	10.0	49	-	132	12,446	8.6	24,892	17.3	37,338	25.9
B-22	RSL-2.5	MDR	13.2	10.0	132	-	356	33,528	23.3	67,056	46.6	100,584	69.9
C-5	RM-5	HDR	5.4	25.0	135	-	230	20,790	14.4	41,580	28.9	62,370	43.3
C-6	RM-5	HDR	5.4	25.0	135	-	230	20,790	14.4	41,580	28.9	62,370	43.3
F-2	LC/GC	COMMERCIAL	13.8	-	-	13.8	-	20,700	14.4	41,400	28.8	62,100	43.1
G-1	OC	OFFICE	5.8	-	-	5.8	-	8,700	6.0	17,400	12.1	26,100	18.1
Village 6 Subtotal:			**116.8**	**-**	**940**	**19.6**	**2,365**	**269,517**	**187.2**	**539,034**	**374.3**	**808,551**	**561.5**
VILLAGE 7 (State Land)													
D-7	MX	MIXED USE	17.9	12.0	108	9.0	216	34,452	23.9	68,904	47.9	103,356	71.8
D-8	MX	MIXED USE	26.1	12.0	157	13.1	314	50,108	34.8	100,216	69.6	150,324	104.4
E-1	LI	LIGHT INDUSTRIAL	68.9	-	-	68.9	-	103,350	71.8	206,700	143.5	310,050	215.3
F-1	LC/GC	COMMERCIAL	18.0	-	-	18.0	-	27,000	18.8	54,000	37.5	81,000	56.3
Village 7 Subtotal:			**130.9**	**-**	**265**	**109.0**	**530**	**214,910**	**149.2**	**429,820**	**298.5**	**644,730**	**447.7**
PARKS/OPEN SPACE[6]			39.0	-	-	-	-	171,600	119.2	171,600	119.2	171,600	119.2
FALCON FIELD SUBTOTAL:			**694.0**	**-**	**4,402**	**225.6**	**10,683**	**1,576,340**	**1,094.7**	**2,981,080**	**2,070.2**	**4,385,820**	**3,045.7**
DESERT WELLS PRESSURE ZONE													
VILLAGE 8 (State Land)													
D-9	MX	MIXED USE	10.7	12.0	65	5.4	130	20,710	14.4	41,420	28.8	62,130	43.1
D-10	MX	MIXED USE	10.6	12.0	64	5.3	128	20,366	14.1	40,732	28.3	61,098	42.4
D-11	MX	MIXED USE	14.0	12.0	84	7.0	168	26,796	18.6	53,592	37.2	80,388	55.8
E-2	LI	LIGHT INDUSTRIAL	41.0	-	-	41.0	-	61,500	42.7	123,000	85.4	184,500	128.1
E-3	LI	LIGHT INDUSTRIAL	1.2	-	-	1.2	-	1,800	1.3	3,600	2.5	5,400	3.8
E-4	LI	LIGHT INDUSTRIAL	3.7	-	-	3.7	-	5,550	3.9	11,100	7.7	16,650	11.6
E-5	LI	LIGHT INDUSTRIAL	12.6	-	-	12.6	-	18,900	13.1	37,800	26.3	56,700	39.4
E-6	LI	LIGHT INDUSTRIAL	15.0	-	-	15.0	-	22,500	15.6	45,000	31.3	67,500	46.9
E-7	LI	LIGHT INDUSTRIAL	15.0	-	-	15.0	-	22,500	15.6	45,000	31.3	67,500	46.9
E-8	LI	LIGHT INDUSTRIAL	26.6	-	-	26.6	-	39,900	27.7	79,800	55.4	119,700	83.1
E-9	LI	LIGHT INDUSTRIAL	18.4	-	-	18.4	-	27,600	19.2	55,200	38.3	82,800	57.5
F-6	LC/GC	COMMERCIAL	21.2	-	-	21.2	-	31,800	22.1	63,600	44.2	95,400	66.3
F-7	LC/GC	COMMERCIAL	13.7	-	-	13.7	-	20,550	14.3	41,100	28.5	61,650	42.8
F-8	LC/GC	COMMERCIAL	13.9	-	-	13.9	-	20,850	14.5	41,700	29.0	62,550	43.4
PARKS/OPEN SPACE[6]			12.7	-	-	-	-	55,880	38.8	55,880	38.8	55,880	38.8
Village 8 Subtotal:			**230.3**	**-**	**213**	**200.0**	**426**	**397,202**	**275.8**	**738,524**	**512.9**	**1,079,846**	**749.9**
DESERT WELLS SUBTOTAL:			**230.3**	**-**	**213**	**200.0**	**426**	**397,202**	**275.8**	**738,524**	**512.9**	**1,079,846**	**749.9**
OTHER/STREETS/ETC.			207.5	-	-	-	-	-	-	-	-	-	-
GRAND TOTAL:			**1,131.8**	**-**	**4,615**	**425.6**	**11,109**	**1,973,542**	**1,370.5**	**3,719,604**	**2,583.1**	**5,465,666**	**3,795.6**

Notes:

Demand Factors:

Medium Density Residential (LDR):	420	gal/dwelling unit/day
Medium Density Residential (LMDR):	400	gal/dwelling unit/day
Medium Density Residential (MDR):	254	gal/dwelling unit/day
High Density Residential (MHDR):	194	gal/dwelling unit/day
High Density Residential (HDR):	154	gal/dwelling unit/day
High Density Condominium:	185	gal/dwelling unit/day
Commercial[3]:	1,500	gal/acre/day
Office[3]:	1,500	gal/acre/day
Industrial:	1,500	gallons/acre/day
Research and Development:	1,500	gallons/acre/day
Turf/Irrigation:	4,400	gallons/acre/day

Density:

2 - 4	du/ac
4 - 6	du/ac
6 - 10	du/ac
10 - 15	du/ac
15 +	du/ac

Population Factor:

3.0	Persons/du
3.2	Persons/du
2.7	Persons/du
2.0	Persons/du
1.7	Persons/du
1.7	Persons/du

Peaking Factors:

Maximum Day Demand:	2.0	x Average Day Demand
Peak Hour Demand:	3.0	x Average Day Demand

Fire Flow[7]:

Residential:	1,500 gpm	for 2 hours
Commercial:	3,000 gpm	for 2 hours
Industrial:	3,000 gpm	for 2 hours

(1) Demand factors from the Engineering Procedure Manual - Engineering & Design Standards (City of Mesa, 2017).
(2) Values shown include inside and outside water use.
(3) Commercial/Office demand factor averaged from surrounding towns as City of Mesa standard is determined by actual square footage of building.
(4) Mixed Use is calculated as 1/2 residential and 1/2 commercial.
(5) Light industrial is a mix of industrial, warehousing, and commercial buildings.
(6) Park/Open Space demands are not peaked as demands are anticipated to remain constant.
(7) Fire Flow assumed from City of Mesa Fire Code.

Table B.3 - Water Demand Summary by Land Use

Hawes Crossing

Mesa, Arizona
October 2019

HILGARTWILSON

Calculated By: MAJ
Checked By: MI

Assigned Parcel Label	Zoning Category	Land Use[4,5]	Gross Area	Assumed Density	Assumed Dwelling Units	Commercial/Industrial Gross Area	Population	Average Day Demand		Max Day Demand		Peak Hour Demand	
			(ac)	(du)	(du/ac)	(ac)		(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)
FALCON FIELD SERVICE ZONE													
A	RS-6 & RSL-4.0	LMDR	128.1	5.0	642	-	2,054	256,800	178.3	513,600	356.7	770,400	535.0
B	RSL-2.5	MDR	203.1	10.0	2,031	-	5,484	515,874	358.2	1,031,748	716.5	1,547,622	1074.7
C	RM-5	MHDR	41.7	25.0	1,044	-	1,775	160,776	111.7	321,552	223.3	482,328	335.0
D	MX	MIXED USE	113.5	12.0	685	57.0	1,370	218,390	151.7	436,780	303.3	655,170	455.0
E	LI	LIGHT INDUSTRIAL	68.9	-	-	68.9	-	103,350	71.8	206,700	143.5	310,050	215.3
F	LC/GC	COMMERCIAL	93.9	-	-	93.9	-	140,850	97.8	281,700	195.6	422,550	293.4
G	OC	OFFICE	5.8	-	-	5.8	-	8,700	6.0	17,400	12.1	26,100	18.1
PARK/OPEN SPACE			39.0	-	-	-	-	171,600	119.2	171,600	119.2	171,600	119.2
FALCON FIELD SUBTOTAL:			**694.0**	**-**	**4,402**	**225.6**	**10,683**	**1,576,340**	**1,094.7**	**2,981,080**	**2,070.2**	**4,385,820**	**3,045.7**
DESERT WELLS SERVICE ZONE													
D	MX	MIXED USE	35.3	12.0	213	17.7	426	67,872	47.1	135,744	94.3	203,616	141.4
E	LI	LIGHT INDUSTRIAL	133.5	-	-	133.5	-	200,250	139.1	400,500	278.1	600,750	417.2
F	LC/GC	COOMMERCIAL	48.8	-	-	48.8	0	73,200	50.8	146,400	101.7	219,600	152.5
PARK/OPEN SPACE			12.7	-	-	-	-	55,880	38.8	55,880	38.8	55,880	38.8
DESERT WELLS SUBTOTAL:			**230.3**	**-**	**213**	**200.0**	**426**	**397,202**	**275.8**	**738,524**	**512.9**	**1,079,846**	**749.9**
OTHER/STREETS/ETC.			207.5	-	-	-	-	-	-	-	-	-	-
GRAND TOTAL:			**1,131.8**	**-**	**4,615**	**425.6**	**11,109**	**1,973,542**	**1,370.5**	**3,719,604**	**2,583.1**	**5,465,666**	**3,795.6**

Notes:

Demand Factors:

Low Density Residential (RR):	490	gal/dwelling unit/day
Low Density Residential (ER):	470	gal/dwelling unit/day
Medium Density Residential (LDR):	420	gal/dwelling unit/day
Medium Density Residential (LMDR):	400	gal/dwelling unit/day
Medium Density Residential (MDR):	254	gal/dwelling unit/day
High Density Residential (MHDR):	194	gal/dwelling unit/day
High Density Residential (HDR):	154	gal/dwelling unit/day
High Density Condominium:	185	gal/dwelling unit/day
Commercial[3]:	1,500	gal/acre/day
Office[3]:	1,500	gal/acre/day
Industrial:	1,500	gallons/acre/day
Research and Development:	1,500	gallons/acre/day
Turf/Irrigation:	4,400	gallons/acre/day

Density:

< 1	du/ac
1 - 2	du/ac
2 - 4	du/ac
4 - 6	du/ac
6 - 10	du/ac
10 - 15	du/ac
15 +	du/ac

Population Factor:

2.5	Persons/du
3.0	Persons/du
3.0	Persons/du
3.2	Persons/du
2.7	Persons/du
2.0	Persons/du
1.7	Persons/du
1.7	Persons/du

Peaking Factors:

Maximum Day Demand:	2.0	x Average Day Demand
Peak Hour Demand:	3.0	x Average Day Demand

Fire Flow[7]:

Residential:	1,500 gpm	for 2 hours
Commercial:	3,000 gpm	for 2 hours
Industrial:	3,000 gpm	for 2 hours

(1) Demand factors from the Engineering Procedure Manual - Engineering & Design Standards (City of Mesa, 2017).
(2) Values shown include inside and outside water use.
(3) Commercial/Office demand factor averaged from surrounding towns as City of Mesa standard is determined by actual square footage of building.
(4) Mixed Use is calculated as 1/2 residential and 1/2 commercial.
(5) Light industrial is a mix of industrial, warehousing, and commercial buildings.
(6) Park/Open Space demands are not peaked as demands are anticipated to remain constant.
(7) Fire Flow assumed from City of Mesa Fire Code.

APPENDIX C

EXCERPTS FROM:

CITY OF MESA
ENGINEERING PROCEDURE MANUAL: 2019 ENGINEERING & DESIGN STANDARDS (CITY OF MESA, 2019)

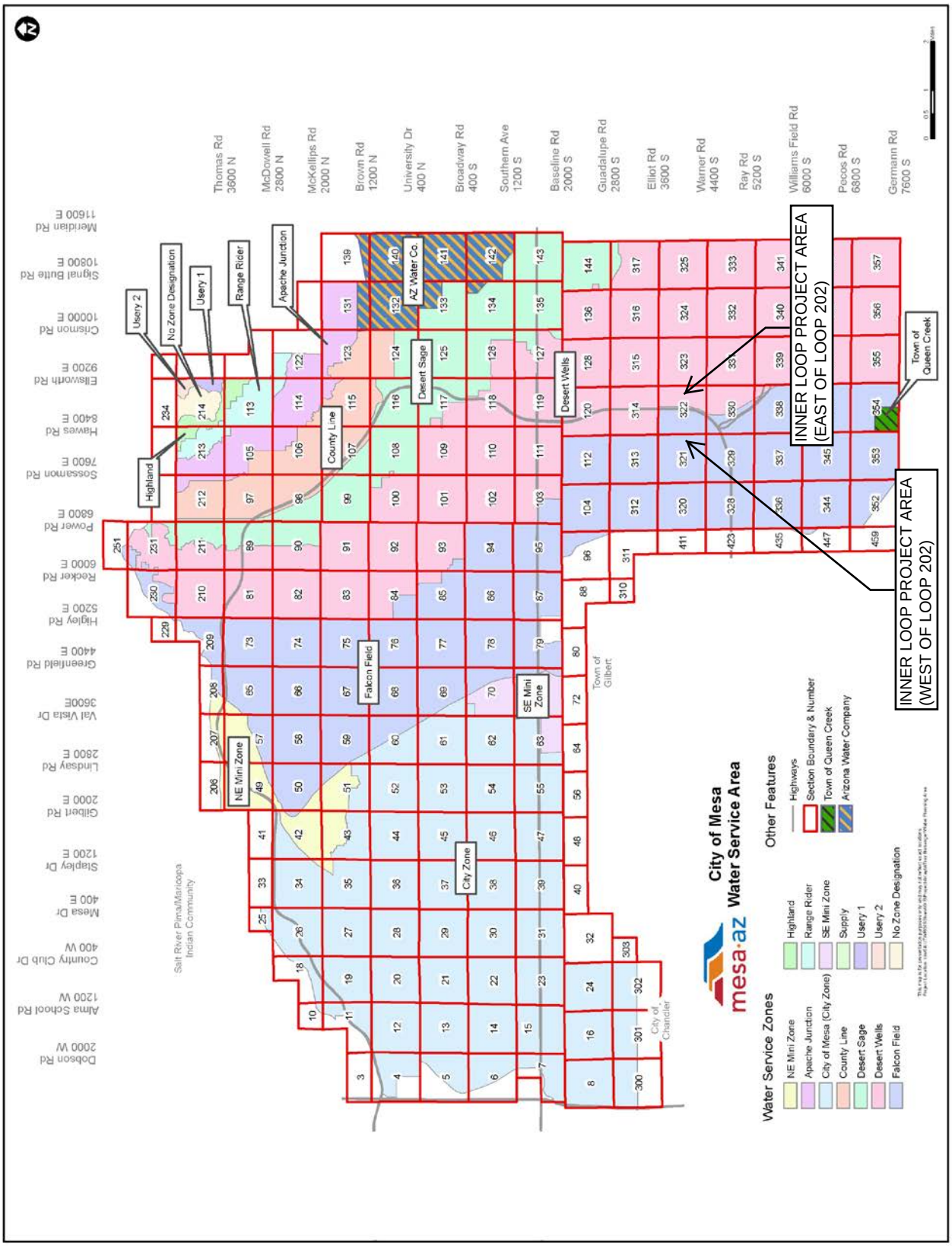


Figure 3.1 – City of Mesa Water Service/Planning Area

APPENDIX D

HYDRANT FLOW TESTS & PUMP CURVES

FALCON FIELD SERVICE ZONE

DESERT WELLS SERVICE ZONE

Flow Test Summary

Project Name:	EJFT 19228
Project Address:	19241 E Elliot Rd, Mesa, AZ 85212
Date of Flow Test:	2019-09-27
Time of Flow Test:	7:05 AM
Data Reliable Until:	2020-03-27
Conducted By:	Austin G., Eder C. & Tayler L. (EJ Flow Tests) 602.999.7637
Witnessed By:	Phil Martell (City of Mesa) 480.262.4460
City Forces Contacted:	City of Mesa (480.262.4460)
Permit Number:	ROW19-02177

Raw Flow Test Data

Static Pressure:	79.0 PSI
Residual Pressure:	70.0 PSI
Flowing GPM:	2,445
GPM @ 20 PSI:	6,749

Data with a 10 % Safety Factor

Static Pressure:	71.1 PSI
Residual Pressure:	62.1 PSI
Flowing GPM:	2,445
GPM @ 20 PSI:	6,245

Hydrant F_1

Pitot Pressure (1):	47	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	4	inches

Additional Coefficient 0.83 on orifice #1

Static-Residual Hydrant

Flow Hydrant

Main Size
24 inches

Distance Between F_1 and R
878 ft (measured linearly)

Static-Residual Elevation
1346 ft (above sea level)

Flow Hydrant (F_1) Elevation
1346 ft (above sea level)

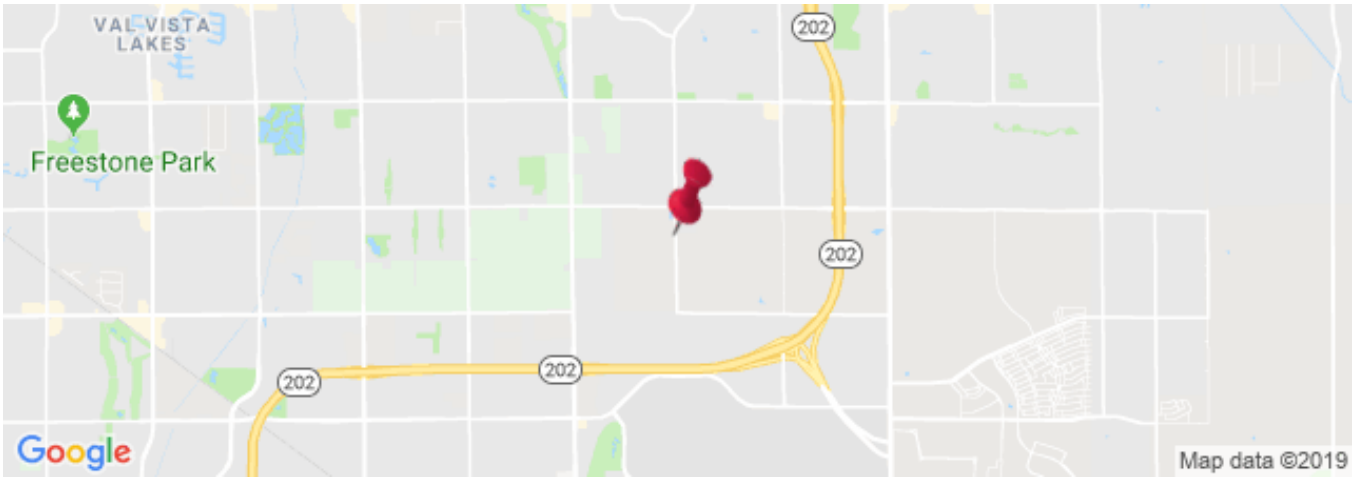
Elevation & distance values are approximate

Flow Test Summary

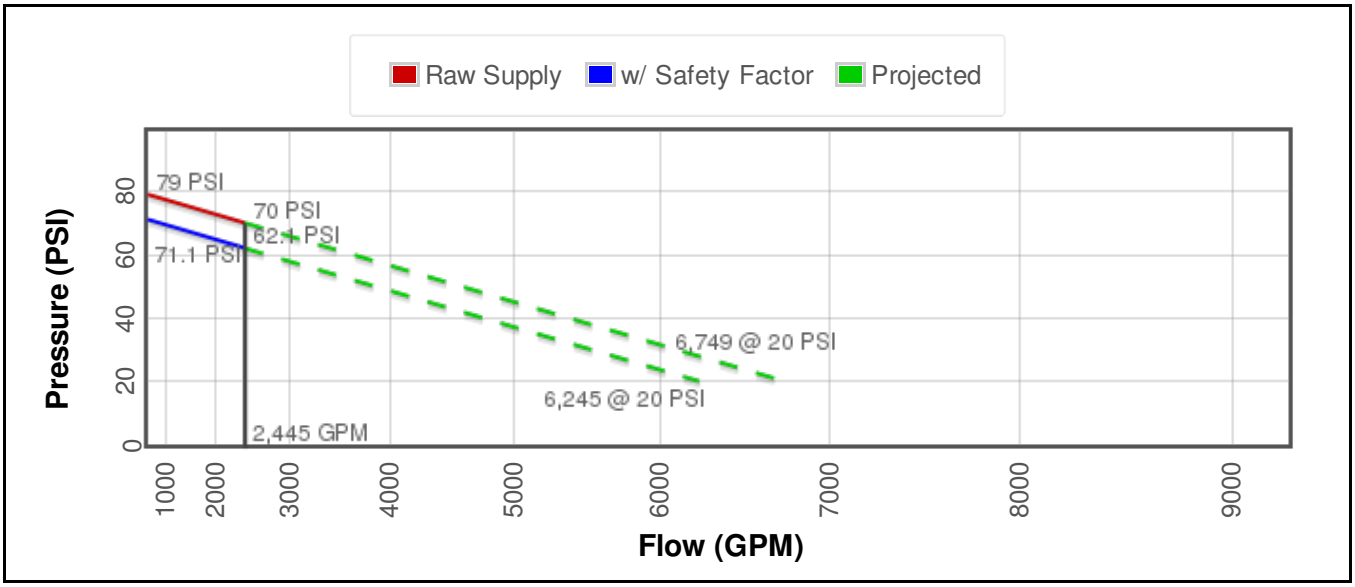
Static-Residual Hydrant

Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site



Water Supply Curve $N^{1.85}$ Graph



Flow Test Pump Curve (Falcon Field Zone)

Hawes Crossing
Sossaman Road, Mesa, AZ
Flow Test Date: September 27, 2019 (7:05 AM)

HILGARTWILSON
ENGINEER | PLAN | SURVEY | MANAGE

Fire Flow Test Results

Static Pressure at Test Hydrant (psi)	79
Residual Pressure at Test Hydrant (psi)	70
Total Discharge at Flowed Hydrants, Qf (gpm)	2,445

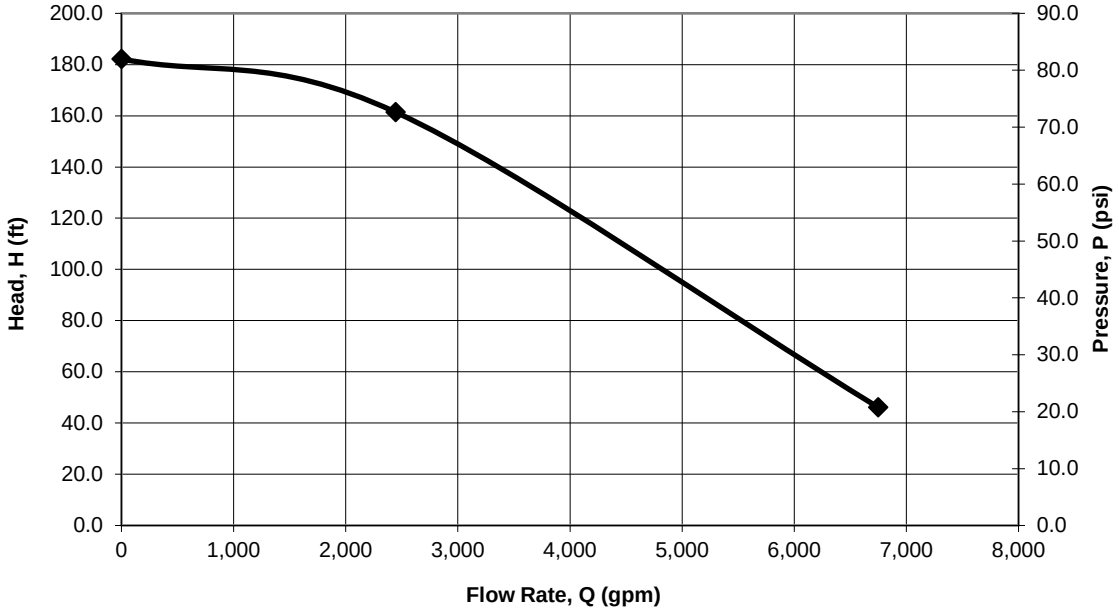
Calculations

Desired Fire Flow Residual Pressure (psi)	20.0
Pressure Drop During Test, hf (psi)	9.0
Pressure Drop During Test (%)	11%
Pressure Drop at Desired Residual Pressure, hr (psi)	59.0
Available Flow at Desired Residual Pressure, Qr (gpm)	6,749

Pump Curve

Q (gpm)	P (psi)	H (ft)
0	79.0	182.2
2,445	70.0	161.4
6,749	20.0	46.1

Pump Curve Extrapolated from Fire Flow Test Results



Flow Test Summary

Project Name:	EJFT 19229
Project Address:	11349 S Ellsworth Rd, Mesa, AZ 85212
Date of Flow Test:	2019-09-27
Time of Flow Test:	7:30 AM
Data Reliable Until:	2020-03-27
Conducted By:	Austin G., Eder C. & Tayler L. (EJ Flow Tests) 602.999.7637
Witnessed By:	Phil Martell (City of Mesa) 480.262.4460
City Forces Contacted:	City of Mesa (480.262.4460)
Permit Number:	ROW19-02178

Raw Flow Test Data

Static Pressure:	94.0 PSI
Residual Pressure:	92.0 PSI
Flowing GPM:	2,277
GPM @ 20 PSI:	16,000

Data with a 10 % Safety Factor

Static Pressure:	84.6 PSI
Residual Pressure:	82.6 PSI
Flowing GPM:	2,277
GPM @ 20 PSI:	14,869

Hydrant F_1

Pitot Pressure (1):	45	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	47	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches

Static-Residual Hydrant

Flow Hydrant

Main Size
16 inches

Distance Between F_1 and R
406 ft (measured linearly)

Static-Residual Elevation
1402 ft (above sea level)

Flow Hydrant (F_1) Elevation
1404 ft (above sea level)

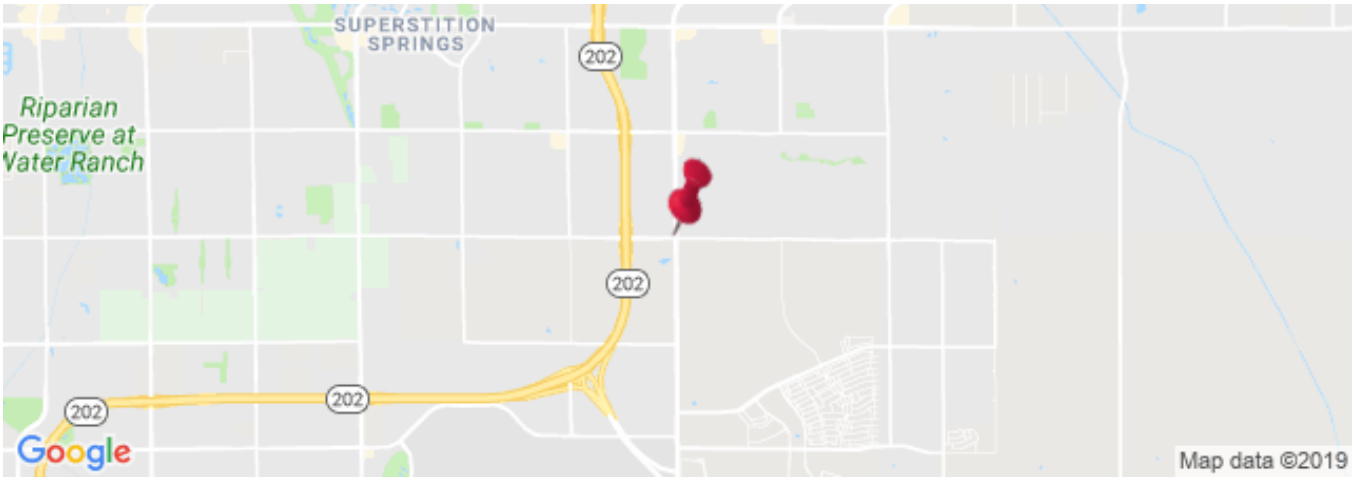
Elevation & distance values are approximate

Flow Test Summary

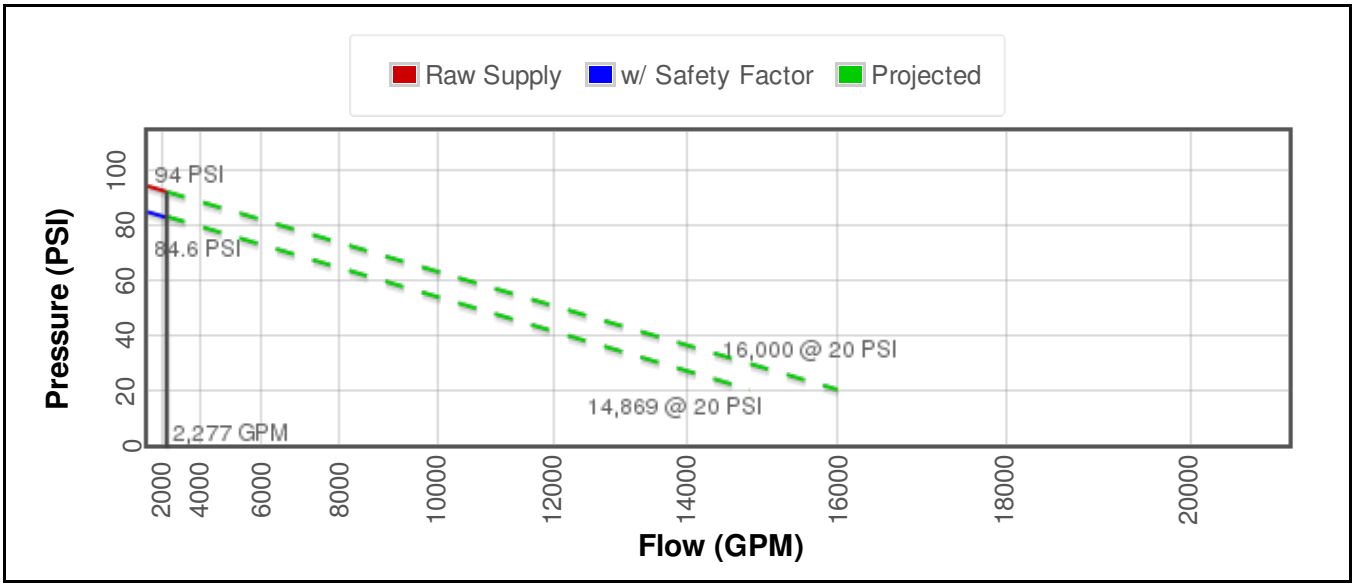
Static-Residual Hydrant

Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site



Water Supply Curve $N^{1.85}$ Graph



Flow Test Pump Curve (Desert Wells Zone)

Hawes Crossing
Elliot Road, Mesa, AZ
Flow Test Date: September 27, 2019 (7:30 AM)

HILGARTWILSON
ENGINEER | PLAN | SURVEY | MANAGE

Fire Flow Test Results

Static Pressure at Test Hydrant (psi)	94
Residual Pressure at Test Hydrant (psi)	92
Total Discharge at Flowed Hydrants, Qf (gpm)	2,277

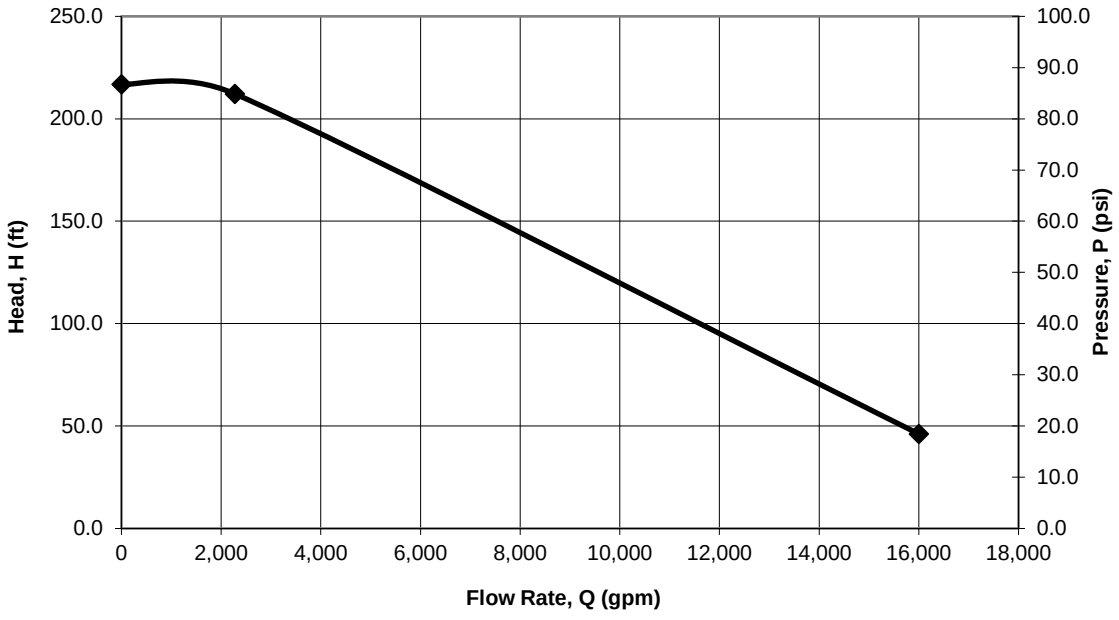
Calculations

Desired Fire Flow Residual Pressure (psi)	20.0
Pressure Drop During Test, hf (psi)	2.0
Pressure Drop During Test (%)	2%
Pressure Drop at Desired Residual Pressure, hr (psi)	74.0
Available Flow at Desired Residual Pressure, Qr (gpm)	16,003

Pump Curve

Q (gpm)	P (psi)	H (ft)
0	94.0	216.8
2,277	92.0	212.2
16,003	20.0	46.1

Pump Curve Extrapolated from Fire Flow Test Results



APPENDIX E

HYDRAULIC MODEL RESULTS

FALCON FIELD SERVICE ZONE

AVERAGE DAY DEMAND

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-1	1,352.00	0.0	1,527.64	76.0	Falcon Field
J-2	1,367.44	0.0	1,527.58	69.3	Falcon Field
J-3	1,368.90	0.0	1,527.58	68.7	Falcon Field
J-4	1,367.00	0.0	1,527.57	69.5	Falcon Field
J-5	1,377.00	0.0	1,527.57	65.1	Falcon Field
J-6	1,391.56	0.0	1,527.56	58.8	Falcon Field
J-7	1,383.17	0.0	1,527.55	62.5	Falcon Field
J-9	1,380.00	12.5	1,527.55	63.8	Falcon Field
J-10	1,377.00	14.3	1,527.55	65.1	Falcon Field
J-11	1,376.00	22.1	1,527.55	65.6	Falcon Field
J-12	1,376.00	0.0	1,527.56	65.6	Falcon Field
J-14	1,372.00	0.0	1,527.56	67.3	Falcon Field
J-15	1,370.00	0.0	1,527.57	68.2	Falcon Field
J-16	1,366.94	0.0	1,527.58	69.5	Falcon Field
J-17	1,363.00	0.0	1,527.59	71.2	Falcon Field
J-18	1,363.00	0.0	1,527.54	71.2	Falcon Field
J-19	1,364.55	25.0	1,527.54	70.5	Falcon Field
J-20	1,368.42	9.5	1,527.53	68.8	Falcon Field
J-21	1,373.74	18.3	1,527.53	66.5	Falcon Field
J-22	1,373.00	9.5	1,527.53	66.9	Falcon Field
J-23	1,375.73	29.8	1,527.53	65.7	Falcon Field
J-24	1,373.00	25.0	1,527.53	66.9	Falcon Field
J-25	1,370.00	19.8	1,527.56	68.2	Falcon Field
J-27	1,350.00	0.0	1,527.64	76.9	Falcon Field
J-28	1,353.33	0.0	1,527.62	75.4	Falcon Field
J-29	1,359.02	0.0	1,527.60	72.9	Falcon Field
J-31	1,383.00	0.0	1,527.56	62.5	Falcon Field
J-33	1,391.00	0.0	1,527.56	59.1	Falcon Field
J-34	1,350.00	0.0	1,527.68	76.9	Falcon Field
J-35	1,340.06	0.0	1,527.65	81.2	Falcon Field
J-36	1,357.76	0.0	1,527.19	73.3	Falcon Field
J-37	1,360.62	31.0	1,527.10	72.0	Falcon Field
J-38	1,363.00	29.8	1,527.08	71.0	Falcon Field
J-39	1,366.07	39.3	1,527.06	69.7	Falcon Field
J-40	1,368.59	0.0	1,527.06	68.6	Falcon Field
J-42	1,371.11	32.6	1,527.06	67.5	Falcon Field
J-43	1,374.74	0.0	1,527.05	65.9	Falcon Field
J-44	1,370.19	25.4	1,527.06	67.9	Falcon Field
J-45	1,369.92	0.0	1,527.06	68.0	Falcon Field
J-47	1,371.00	0.0	1,527.06	67.5	Falcon Field
J-48	1,371.96	0.0	1,527.07	67.1	Falcon Field
J-49	1,372.00	0.0	1,527.08	67.1	Falcon Field
J-50	1,375.00	0.0	1,527.12	65.8	Falcon Field
J-51	1,375.00	0.0	1,527.16	65.8	Falcon Field
J-53	1,372.25	0.0	1,527.29	67.1	Falcon Field
J-56	1,361.52	24.8	1,527.16	71.7	Falcon Field
J-57	1,365.51	0.0	1,527.20	70.0	Falcon Field
J-58	1,366.52	13.1	1,527.26	69.5	Falcon Field
J-59	1,366.00	0.0	1,527.30	69.8	Falcon Field
J-60	1,369.00	13.1	1,527.29	68.5	Falcon Field
J-61	1,372.26	22.5	1,527.29	67.1	Falcon Field
J-62	1,376.66	23.9	1,527.24	65.1	Falcon Field
J-63	1,380.00	18.8	1,527.21	63.7	Falcon Field
J-64	1,382.00	71.8	1,527.17	62.8	Falcon Field
J-65	1,376.69	34.8	1,527.16	65.1	Falcon Field
J-66	1,375.62	25.9	1,527.13	65.5	Falcon Field

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-67	1,373.00	13.3	1,527.10	66.7	Falcon Field
J-68	1,368.17	29.8	1,527.09	68.8	Falcon Field
J-69	1,368.00	13.3	1,527.09	68.8	Falcon Field
J-70	1,362.29	0.0	1,527.09	71.3	Falcon Field
J-71	1,359.87	0.0	1,527.09	72.4	Falcon Field
J-72	1,358.04	26.0	1,527.09	73.1	Falcon Field
J-73	1,356.56	18.1	1,527.11	73.8	Falcon Field
J-74	1,357.00	36.7	1,527.14	73.6	Falcon Field
J-75	1,359.00	7.9	1,527.15	72.8	Falcon Field
J-76	1,361.45	9.3	1,527.14	71.7	Falcon Field
J-77	1,359.92	9.3	1,527.10	72.3	Falcon Field
J-78	1,368.00	23.6	1,527.21	68.9	Falcon Field
J-79	1,367.89	23.6	1,527.12	68.9	Falcon Field
J-80	1,367.99	17.8	1,527.06	68.8	Falcon Field
J-81	1,366.00	0.0	1,527.06	69.7	Falcon Field
J-82	1,365.89	29.8	1,527.05	69.7	Falcon Field
J-83	1,367.21	11.5	1,527.06	69.2	Falcon Field
J-84	1,367.00	0.0	1,527.06	69.3	Falcon Field
J-85	1,363.00	0.0	1,527.07	71.0	Falcon Field
J-87	1,359.50	18.1	1,527.06	72.5	Falcon Field
J-88	1,361.00	36.2	1,527.05	71.8	Falcon Field
J-89	1,362.85	9.5	1,527.05	71.0	Falcon Field
J-90	1,364.00	0.0	1,527.05	70.5	Falcon Field
J-91	1,365.00	0.0	1,527.07	70.1	Falcon Field
J-92	1,362.66	14.4	1,527.07	71.1	Falcon Field
J-93	1,359.45	23.3	1,527.10	72.5	Falcon Field
J-95	1,364.00	0.0	1,527.05	70.5	Falcon Field
J-96	1,370.00	0.0	1,527.06	68.0	Falcon Field
J-97	1,369.23	9.5	1,527.06	68.3	Falcon Field
J-98	1,367.89	0.0	1,527.06	68.9	Falcon Field
J-99	1,372.00	21.4	1,527.06	67.1	Falcon Field
J-100	1,367.00	0.0	1,527.06	69.3	Falcon Field
J-101	1,368.12	14.4	1,527.06	68.8	Falcon Field
J-102	1,364.04	0.0	1,527.06	70.5	Falcon Field
J-103	1,362.00	0.0	1,527.07	71.4	Falcon Field
J-105	1,370.15	8.6	1,527.06	67.9	Falcon Field
J-107	1,376.39	48.0	1,527.05	65.2	Falcon Field
J-108	1,376.50	17.6	1,527.05	65.1	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-1	2,656	J-2	J-1	12	130.0	76.4	0.22	0.022	Falcon Field
P-2	293	J-3	J-2	12	130.0	31.2	0.09	0.004	Falcon Field
P-3	818	J-4	J-3	12	130.0	31.2	0.09	0.004	Falcon Field
P-4	2,020	J-5	J-4	12	130.0	31.2	0.09	0.004	Falcon Field
P-5	2,157	J-6	J-5	16	130.0	31.2	0.05	0.001	Falcon Field
P-6	2,381	J-6	J-7	12	130.0	31.2	0.09	0.004	Falcon Field
P-7	977	J-9	J-7	12	130.0	31.2	0.09	0.004	Falcon Field
P-9	801	J-10	J-9	12	130.0	13.4	0.04	0.001	Falcon Field
P-10	390	J-11	J-10	12	130.0	27.7	0.08	0.003	Falcon Field
P-11	725	J-12	J-11	12	130.0	49.8	0.14	0.010	Falcon Field
P-12	613	J-14	J-12	30	130.0	380.8	0.17	0.005	Falcon Field
P-14	689	J-15	J-14	30	130.0	380.8	0.17	0.005	Falcon Field
P-15	644	J-15	J-16	30	130.0	772.3	0.35	0.018	Falcon Field
P-16	710	J-16	J-17	30	130.0	772.3	0.35	0.018	Falcon Field
P-18	700	J-19	J-18	8	130.0	0.0	0.00	0.000	Falcon Field
P-19	733	J-2	J-19	8	130.0	45.2	0.29	0.059	Falcon Field
P-20	687	J-19	J-20	8	130.0	20.2	0.13	0.013	Falcon Field
P-21	944	J-21	J-20	8	130.0	6.5	0.04	0.002	Falcon Field
P-22	927	J-22	J-21	8	130.0	11.9	0.08	0.005	Falcon Field
P-23	656	J-9	J-22	8	130.0	32.1	0.20	0.031	Falcon Field
P-24	923	J-20	J-23	8	130.0	4.2	0.03	0.001	Falcon Field
P-24	925	J-23	J-22	8	130.0	10.7	0.07	0.004	Falcon Field
P-25	326	J-23	J-24	8	130.0	14.9	0.10	0.007	Falcon Field
P-26	583	J-24	J-25	8	130.0	39.9	0.25	0.047	Falcon Field
P-27	721	J-25	J-15	12	130.0	59.7	0.17	0.014	Falcon Field
P-28	2,614	J-1	J-27	24	130.0	76.4	0.05	0.001	Falcon Field
P-29	1,110	J-28	J-27	30	130.0	772.3	0.35	0.018	Falcon Field
P-30	907	J-29	J-28	30	130.0	772.3	0.35	0.018	Falcon Field
P-31	650	J-29	J-17	30	130.0	772.3	0.35	0.018	Falcon Field
P-32	1,330	J-31	J-12	42	130.0	0.0	0.00	0.000	Falcon Field
P-34	1,142	J-31	J-33	42	130.0	0.0	0.00	0.000	Falcon Field
P-36	652	J-27	J-34	24	130.0	848.7	0.60	0.064	Falcon Field
P-37	4,613	J-34	J-35	24	130.0	235.3	0.17	0.006	Falcon Field
P-38	2,641	J-36	J-35	12	130.0	235.3	0.67	0.174	Falcon Field
P-39	918	J-37	J-36	12	130.0	171.8	0.49	0.097	Falcon Field
P-40	429	J-38	J-37	12	130.0	140.8	0.40	0.067	Falcon Field
P-41	687	J-38	J-39	12	130.0	73.5	0.21	0.020	Falcon Field
P-42	622	J-39	J-40	12	130.0	34.2	0.10	0.005	Falcon Field
P-43	658	J-42	J-40	12	130.0	39.4	0.11	0.006	Falcon Field
P-45	657	J-42	J-43	12	130.0	6.8	0.02	0.000	Falcon Field
P-46	492	J-45	J-44	12	130.0	16.8	0.05	0.001	Falcon Field
P-47	414	J-40	J-45	12	130.0	16.8	0.05	0.001	Falcon Field
P-48	811	J-40	J-47	12	130.0	22.0	0.06	0.002	Falcon Field
P-50	541	J-47	J-48	12	130.0	77.0	0.22	0.022	Falcon Field
P-51	553	J-48	J-49	12	130.0	77.0	0.22	0.022	Falcon Field
P-52	719	J-49	J-50	12	130.0	124.2	0.35	0.053	Falcon Field
P-53	738	J-50	J-51	12	130.0	124.2	0.35	0.053	Falcon Field
P-54	1,093	J-51	J-53	12	130.0	190.5	0.54	0.118	Falcon Field
P-56	822	J-12	J-53	12	130.0	331.0	0.94	0.327	Falcon Field
P-58	822	J-59	J-15	12	130.0	331.8	0.94	0.329	Falcon Field
P-60	369	J-56	J-57	12	130.0	170.8	0.48	0.096	Falcon Field
P-61	647	J-58	J-57	12	130.0	170.8	0.48	0.096	Falcon Field
P-62	346	J-59	J-58	12	130.0	183.9	0.52	0.110	Falcon Field
P-63	401	J-60	J-59	12	130.0	42.2	0.12	0.007	Falcon Field
P-64	554	J-61	J-60	12	130.0	29.2	0.08	0.004	Falcon Field
P-65	349	J-53	J-61	12	130.0	6.7	0.02	0.000	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-66	675	J-53	J-62	12	130.0	147.2	0.42	0.073	Falcon Field
P-67	648	J-62	J-63	12	130.0	123.3	0.35	0.053	Falcon Field
P-68	1,093	J-64	J-63	12	130.0	104.5	0.30	0.039	Falcon Field
P-69	659	J-65	J-64	12	130.0	32.7	0.09	0.004	Falcon Field
P-70	651	J-51	J-65	12	130.0	2.1	0.01	0.000	Falcon Field
P-71	328	J-66	J-51	8	130.0	64.2	0.41	0.113	Falcon Field
P-72	586	J-67	J-66	8	130.0	38.3	0.24	0.043	Falcon Field
P-73	391	J-68	J-67	8	130.0	24.9	0.16	0.020	Falcon Field
P-74	340	J-69	J-68	8	130.0	14.5	0.09	0.007	Falcon Field
P-75	663	J-70	J-69	8	130.0	1.2	0.01	0.000	Falcon Field
P-76	361	J-71	J-70	8	130.0	1.2	0.01	0.000	Falcon Field
P-78	321	J-71	J-72	8	130.0	1.0	0.01	0.000	Falcon Field
P-79	866	J-73	J-72	8	130.0	27.0	0.17	0.023	Falcon Field
P-80	567	J-73	J-74	8	130.0	45.1	0.29	0.059	Falcon Field
P-81	361	J-74	J-75	12	130.0	81.8	0.23	0.024	Falcon Field
P-82	288	J-75	J-56	12	130.0	89.8	0.25	0.029	Falcon Field
P-83	258	J-76	J-56	8	130.0	56.3	0.36	0.089	Falcon Field
P-84	565	J-77	J-76	8	130.0	47.0	0.30	0.063	Falcon Field
P-85	278	J-71	J-77	8	130.0	37.6	0.24	0.042	Falcon Field
P-86	309	J-78	J-59	8	130.0	105.7	0.67	0.285	Falcon Field
P-87	493	J-79	J-78	8	130.0	82.1	0.52	0.178	Falcon Field
P-88	295	J-68	J-79	8	130.0	58.4	0.37	0.095	Falcon Field
P-89	608	J-68	J-80	8	130.0	39.1	0.25	0.045	Falcon Field
P-90	577	J-80	J-81	8	130.0	21.3	0.14	0.015	Falcon Field
P-91	548	J-82	J-81	8	130.0	12.4	0.08	0.005	Falcon Field
P-92	283	J-82	J-83	8	130.0	16.4	0.10	0.009	Falcon Field
P-93	260	J-83	J-84	8	130.0	27.8	0.18	0.024	Falcon Field
P-94	547	J-85	J-84	8	130.0	17.0	0.11	0.010	Falcon Field
P-97	719	J-87	J-71	8	130.0	39.7	0.25	0.047	Falcon Field
P-98	752	J-87	J-88	8	130.0	21.6	0.14	0.015	Falcon Field
P-99	705	J-88	J-89	8	130.0	14.6	0.09	0.007	Falcon Field
P-100	559	J-89	J-90	8	130.0	9.9	0.06	0.003	Falcon Field
P-101	371	J-90	J-82	8	130.0	9.9	0.06	0.004	Falcon Field
P-102	361	J-84	J-91	8	130.0	16.5	0.11	0.009	Falcon Field
P-103	541	J-91	J-92	8	130.0	16.5	0.11	0.009	Falcon Field
P-104	697	J-93	J-92	8	130.0	40.3	0.26	0.047	Falcon Field
P-105	814	J-36	J-93	8	130.0	63.5	0.41	0.111	Falcon Field
P-107	537	J-95	J-89	8	130.0	14.2	0.09	0.007	Falcon Field
P-108	372	J-81	J-95	8	130.0	14.2	0.09	0.007	Falcon Field
P-109	401	J-96	J-81	8	130.0	5.3	0.03	0.001	Falcon Field
P-110	544	J-97	J-96	8	130.0	5.3	0.03	0.001	Falcon Field
P-111	548	J-98	J-97	8	130.0	11.0	0.07	0.004	Falcon Field
P-112	378	J-82	J-98	8	130.0	11.0	0.07	0.004	Falcon Field
P-113	316	J-97	J-99	8	130.0	25.8	0.16	0.020	Falcon Field
P-113	540	J-85	J-38	8	130.0	22.0	0.14	0.016	Falcon Field
P-114	326	J-99	J-49	8	130.0	47.2	0.30	0.064	Falcon Field
P-114	300	J-101	J-105	8	130.0	5.6	0.04	0.001	Falcon Field
P-115	383	J-100	J-84	8	130.0	5.7	0.04	0.001	Falcon Field
P-115	345	J-105	J-47	8	130.0	3.1	0.02	0.000	Falcon Field
P-116	562	J-101	J-100	8	130.0	5.7	0.04	0.001	Falcon Field
P-116	662	J-47	J-107	12	130.0	51.9	0.15	0.011	Falcon Field
P-117	543	J-102	J-101	8	130.0	14.3	0.09	0.007	Falcon Field
P-118	391	J-85	J-102	8	130.0	14.3	0.09	0.007	Falcon Field
P-118	981	J-107	J-108	12	130.0	3.9	0.01	0.000	Falcon Field
P-119	342	J-103	J-85	8	130.0	9.3	0.06	0.003	Falcon Field
P-120	590	J-92	J-103	8	130.0	9.3	0.06	0.003	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-123	1,124	J-43	J-108	12	130.0	13.7	0.04	0.001	Falcon Field
P-126	2,226	J-38	J-44	8	130.0	15.5	0.10	0.008	Falcon Field
P-127	1,743	J-44	J-43	8	130.0	6.9	0.04	0.002	Falcon Field
P-900	231	R-1	PMP-1	48	130.0	1,084.0	0.19	0.000	Falcon Field
P-901	234	PMP-1	J-34	48	130.0	1,084.0	0.19	0.000	Falcon Field

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gal/min)	Pump Head (ft)
PMP-1	1,350.00	1,350.10	1,527.68	1,084.0	177.58

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gal/min)	Hydraulic Grade (ft)
R-1	1,350.10	1,084.0	1,350.10

MAXIMUM DAY DEMAND

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-1	1,352.00	0.0	1,517.16	71.5	Falcon Field
J-2	1,367.44	0.0	1,516.98	64.7	Falcon Field
J-3	1,368.90	0.0	1,516.97	64.1	Falcon Field
J-4	1,367.00	0.0	1,516.96	64.9	Falcon Field
J-5	1,377.00	0.0	1,516.93	60.5	Falcon Field
J-6	1,391.56	0.0	1,516.93	54.2	Falcon Field
J-7	1,383.17	0.0	1,516.89	57.9	Falcon Field
J-9	1,380.00	25.0	1,516.88	59.2	Falcon Field
J-10	1,377.00	28.6	1,516.88	60.5	Falcon Field
J-11	1,376.00	44.2	1,516.88	61.0	Falcon Field
J-12	1,376.00	0.0	1,516.91	61.0	Falcon Field
J-14	1,372.00	0.0	1,516.92	62.7	Falcon Field
J-15	1,370.00	0.0	1,516.93	63.6	Falcon Field
J-16	1,366.94	0.0	1,516.97	64.9	Falcon Field
J-17	1,363.00	0.0	1,517.01	66.6	Falcon Field
J-18	1,363.00	0.0	1,516.84	66.6	Falcon Field
J-19	1,364.55	50.0	1,516.84	65.9	Falcon Field
J-20	1,368.42	19.0	1,516.82	64.2	Falcon Field
J-21	1,373.74	36.7	1,516.81	61.9	Falcon Field
J-22	1,373.00	19.0	1,516.83	62.2	Falcon Field
J-23	1,375.73	29.8	1,516.82	61.0	Falcon Field
J-24	1,373.00	50.1	1,516.82	62.2	Falcon Field
J-25	1,370.00	39.6	1,516.90	63.6	Falcon Field
J-27	1,350.00	0.0	1,517.16	72.3	Falcon Field
J-28	1,353.33	0.0	1,517.10	70.9	Falcon Field
J-29	1,359.02	0.0	1,517.05	68.4	Falcon Field
J-31	1,383.00	0.0	1,516.91	57.9	Falcon Field
J-33	1,391.00	0.0	1,516.91	54.5	Falcon Field
J-34	1,350.00	0.0	1,517.30	72.4	Falcon Field
J-35	1,340.06	0.0	1,517.21	76.6	Falcon Field
J-36	1,357.76	0.0	1,515.73	68.3	Falcon Field
J-37	1,360.62	62.0	1,515.44	67.0	Falcon Field
J-38	1,363.00	29.8	1,515.35	65.9	Falcon Field
J-39	1,366.07	78.7	1,515.30	64.6	Falcon Field
J-40	1,368.59	0.0	1,515.29	63.5	Falcon Field
J-42	1,371.11	65.2	1,515.27	62.4	Falcon Field
J-43	1,374.74	0.0	1,515.27	60.8	Falcon Field
J-44	1,370.19	50.8	1,515.28	62.8	Falcon Field
J-45	1,369.92	0.0	1,515.28	62.9	Falcon Field
J-47	1,371.00	0.0	1,515.29	62.4	Falcon Field
J-48	1,371.96	0.0	1,515.33	62.0	Falcon Field
J-49	1,372.00	0.0	1,515.36	62.0	Falcon Field
J-50	1,375.00	0.0	1,515.48	60.8	Falcon Field
J-51	1,375.00	0.0	1,515.60	60.8	Falcon Field
J-53	1,372.25	0.0	1,516.02	62.2	Falcon Field
J-56	1,361.52	49.6	1,515.59	66.7	Falcon Field
J-57	1,365.51	0.0	1,515.70	65.0	Falcon Field
J-58	1,366.52	26.1	1,515.91	64.6	Falcon Field
J-59	1,366.00	0.0	1,516.04	64.9	Falcon Field
J-60	1,369.00	26.1	1,516.03	63.6	Falcon Field
J-61	1,372.26	44.9	1,516.02	62.2	Falcon Field
J-62	1,376.66	47.9	1,515.85	60.2	Falcon Field
J-63	1,380.00	37.5	1,515.74	58.7	Falcon Field
J-64	1,382.00	143.5	1,515.61	57.8	Falcon Field
J-65	1,376.69	69.6	1,515.60	60.1	Falcon Field
J-66	1,375.62	51.9	1,515.49	60.5	Falcon Field

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-67	1,373.00	26.7	1,515.42	61.6	Falcon Field
J-68	1,368.17	29.8	1,515.40	63.7	Falcon Field
J-69	1,368.00	26.7	1,515.38	63.8	Falcon Field
J-70	1,362.29	0.0	1,515.38	66.2	Falcon Field
J-71	1,359.87	0.0	1,515.38	67.3	Falcon Field
J-72	1,358.04	52.1	1,515.38	68.1	Falcon Field
J-73	1,356.56	36.2	1,515.43	68.7	Falcon Field
J-74	1,357.00	73.4	1,515.53	68.6	Falcon Field
J-75	1,359.00	15.9	1,515.56	67.7	Falcon Field
J-76	1,361.45	18.7	1,515.52	66.7	Falcon Field
J-77	1,359.92	18.7	1,515.41	67.3	Falcon Field
J-78	1,368.00	47.3	1,515.75	63.9	Falcon Field
J-79	1,367.89	47.3	1,515.48	63.9	Falcon Field
J-80	1,367.99	35.6	1,515.31	63.7	Falcon Field
J-81	1,366.00	0.0	1,515.29	64.6	Falcon Field
J-82	1,365.89	29.8	1,515.28	64.6	Falcon Field
J-83	1,367.21	22.9	1,515.29	64.1	Falcon Field
J-84	1,367.00	0.0	1,515.30	64.2	Falcon Field
J-85	1,363.00	0.0	1,515.32	65.9	Falcon Field
J-87	1,359.50	36.2	1,515.27	67.4	Falcon Field
J-88	1,361.00	72.4	1,515.24	66.7	Falcon Field
J-89	1,362.85	19.0	1,515.26	65.9	Falcon Field
J-90	1,364.00	0.0	1,515.27	65.4	Falcon Field
J-91	1,365.00	0.0	1,515.31	65.0	Falcon Field
J-92	1,362.66	28.9	1,515.33	66.1	Falcon Field
J-93	1,359.45	46.6	1,515.43	67.5	Falcon Field
J-95	1,364.00	0.0	1,515.28	65.5	Falcon Field
J-96	1,370.00	0.0	1,515.29	62.9	Falcon Field
J-97	1,369.23	19.0	1,515.29	63.2	Falcon Field
J-98	1,367.89	0.0	1,515.28	63.8	Falcon Field
J-99	1,372.00	42.9	1,515.30	62.0	Falcon Field
J-100	1,367.00	0.0	1,515.30	64.2	Falcon Field
J-101	1,368.12	28.9	1,515.29	63.7	Falcon Field
J-102	1,364.04	0.0	1,515.31	65.4	Falcon Field
J-103	1,362.00	0.0	1,515.32	66.3	Falcon Field
J-105	1,370.15	17.3	1,515.29	62.8	Falcon Field
J-107	1,376.39	96.0	1,515.27	60.1	Falcon Field
J-108	1,376.50	35.2	1,515.27	60.0	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-1	2,656	J-2	J-1	12	130.0	142.6	0.40	0.069	Falcon Field
P-2	293	J-3	J-2	12	130.0	59.8	0.17	0.014	Falcon Field
P-3	818	J-4	J-3	12	130.0	59.8	0.17	0.014	Falcon Field
P-4	2,020	J-5	J-4	12	130.0	59.8	0.17	0.014	Falcon Field
P-5	2,157	J-6	J-5	16	130.0	59.8	0.10	0.003	Falcon Field
P-6	2,381	J-6	J-7	12	130.0	59.8	0.17	0.014	Falcon Field
P-7	977	J-9	J-7	12	130.0	59.8	0.17	0.014	Falcon Field
P-9	801	J-10	J-9	12	130.0	18.9	0.05	0.002	Falcon Field
P-10	390	J-11	J-10	12	130.0	47.5	0.13	0.009	Falcon Field
P-11	725	J-12	J-11	12	130.0	91.7	0.26	0.030	Falcon Field
P-12	613	J-14	J-12	30	130.0	722.7	0.33	0.016	Falcon Field
P-14	689	J-15	J-14	30	130.0	722.7	0.33	0.016	Falcon Field
P-15	644	J-15	J-16	30	130.0	1,462.8	0.66	0.059	Falcon Field
P-16	710	J-16	J-17	30	130.0	1,462.8	0.66	0.059	Falcon Field
P-18	700	J-19	J-18	8	130.0	0.0	0.00	0.000	Falcon Field
P-19	733	J-2	J-19	8	130.0	82.9	0.53	0.181	Falcon Field
P-20	687	J-19	J-20	8	130.0	32.9	0.21	0.033	Falcon Field
P-21	944	J-21	J-20	8	130.0	15.5	0.10	0.008	Falcon Field
P-22	927	J-22	J-21	8	130.0	21.2	0.14	0.014	Falcon Field
P-23	656	J-9	J-22	8	130.0	53.6	0.34	0.081	Falcon Field
P-24	923	J-20	J-23	8	130.0	1.6	0.01	0.000	Falcon Field
P-24	925	J-23	J-22	8	130.0	13.4	0.09	0.006	Falcon Field
P-25	326	J-23	J-24	8	130.0	18.0	0.12	0.011	Falcon Field
P-26	583	J-24	J-25	8	130.0	68.1	0.43	0.126	Falcon Field
P-27	721	J-25	J-15	12	130.0	107.7	0.31	0.041	Falcon Field
P-28	2,614	J-1	J-27	24	130.0	142.6	0.10	0.002	Falcon Field
P-29	1,110	J-28	J-27	30	130.0	1,462.8	0.66	0.059	Falcon Field
P-30	907	J-29	J-28	30	130.0	1,462.8	0.66	0.059	Falcon Field
P-31	650	J-29	J-17	30	130.0	1,462.8	0.66	0.059	Falcon Field
P-32	1,330	J-31	J-12	42	130.0	0.0	0.00	0.000	Falcon Field
P-34	1,142	J-31	J-33	42	130.0	0.0	0.00	0.000	Falcon Field
P-36	652	J-27	J-34	24	130.0	1,605.4	1.14	0.208	Falcon Field
P-37	4,613	J-34	J-35	24	130.0	443.5	0.31	0.019	Falcon Field
P-38	2,641	J-36	J-35	12	130.0	443.5	1.26	0.562	Falcon Field
P-39	918	J-37	J-36	12	130.0	322.5	0.91	0.312	Falcon Field
P-40	429	J-38	J-37	12	130.0	260.5	0.74	0.210	Falcon Field
P-41	687	J-38	J-39	12	130.0	152.4	0.43	0.078	Falcon Field
P-42	622	J-39	J-40	12	130.0	73.7	0.21	0.020	Falcon Field
P-43	658	J-42	J-40	12	130.0	79.7	0.23	0.023	Falcon Field
P-45	657	J-42	J-43	12	130.0	14.4	0.04	0.001	Falcon Field
P-46	492	J-45	J-44	12	130.0	32.8	0.09	0.004	Falcon Field
P-47	414	J-40	J-45	12	130.0	32.8	0.09	0.004	Falcon Field
P-48	811	J-40	J-47	12	130.0	38.7	0.11	0.006	Falcon Field
P-50	541	J-47	J-48	12	130.0	141.8	0.40	0.068	Falcon Field
P-51	553	J-48	J-49	12	130.0	141.8	0.40	0.068	Falcon Field
P-52	719	J-49	J-50	12	130.0	226.1	0.64	0.162	Falcon Field
P-53	738	J-50	J-51	12	130.0	226.1	0.64	0.161	Falcon Field
P-54	1,093	J-51	J-53	12	130.0	360.5	1.02	0.383	Falcon Field
P-56	822	J-12	J-53	12	130.0	631.0	1.79	1.080	Falcon Field
P-58	822	J-59	J-15	12	130.0	632.4	1.79	1.085	Falcon Field
P-60	369	J-56	J-57	12	130.0	325.1	0.92	0.316	Falcon Field
P-61	647	J-58	J-57	12	130.0	325.1	0.92	0.316	Falcon Field
P-62	346	J-59	J-58	12	130.0	351.2	1.00	0.365	Falcon Field
P-63	401	J-60	J-59	12	130.0	82.5	0.23	0.025	Falcon Field
P-64	554	J-61	J-60	12	130.0	56.4	0.16	0.012	Falcon Field
P-65	349	J-53	J-61	12	130.0	11.5	0.03	0.001	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-66	675	J-53	J-62	12	130.0	282.0	0.80	0.243	Falcon Field
P-67	648	J-62	J-63	12	130.0	234.2	0.66	0.172	Falcon Field
P-68	1,093	J-64	J-63	12	130.0	196.7	0.56	0.125	Falcon Field
P-69	659	J-65	J-64	12	130.0	53.1	0.15	0.011	Falcon Field
P-70	651	J-51	J-65	12	130.0	16.5	0.05	0.001	Falcon Field
P-71	328	J-66	J-51	8	130.0	117.9	0.75	0.348	Falcon Field
P-72	586	J-67	J-66	8	130.0	66.0	0.42	0.119	Falcon Field
P-73	391	J-68	J-67	8	130.0	39.3	0.25	0.046	Falcon Field
P-74	340	J-69	J-68	8	130.0	40.2	0.26	0.048	Falcon Field
P-75	663	J-70	J-69	8	130.0	13.6	0.09	0.006	Falcon Field
P-76	361	J-71	J-70	8	130.0	13.6	0.09	0.006	Falcon Field
P-78	321	J-71	J-72	8	130.0	5.8	0.04	0.001	Falcon Field
P-79	866	J-73	J-72	8	130.0	46.3	0.30	0.062	Falcon Field
P-80	567	J-73	J-74	8	130.0	82.5	0.53	0.180	Falcon Field
P-81	361	J-74	J-75	12	130.0	155.9	0.44	0.081	Falcon Field
P-82	288	J-75	J-56	12	130.0	171.8	0.49	0.097	Falcon Field
P-83	258	J-76	J-56	8	130.0	103.8	0.66	0.275	Falcon Field
P-84	565	J-77	J-76	8	130.0	85.1	0.54	0.191	Falcon Field
P-85	278	J-71	J-77	8	130.0	66.4	0.42	0.120	Falcon Field
P-86	309	J-78	J-59	8	130.0	198.7	1.27	0.916	Falcon Field
P-87	493	J-79	J-78	8	130.0	151.4	0.97	0.554	Falcon Field
P-88	295	J-68	J-79	8	130.0	104.1	0.66	0.277	Falcon Field
P-89	608	J-68	J-80	8	130.0	73.4	0.47	0.145	Falcon Field
P-90	577	J-80	J-81	8	130.0	37.9	0.24	0.042	Falcon Field
P-91	548	J-82	J-81	8	130.0	16.6	0.11	0.009	Falcon Field
P-92	283	J-82	J-83	8	130.0	23.0	0.15	0.017	Falcon Field
P-93	260	J-83	J-84	8	130.0	46.0	0.29	0.061	Falcon Field
P-94	547	J-85	J-84	8	130.0	32.1	0.20	0.031	Falcon Field
P-97	719	J-87	J-71	8	130.0	74.2	0.47	0.148	Falcon Field
P-98	752	J-87	J-88	8	130.0	38.0	0.24	0.043	Falcon Field
P-99	705	J-88	J-89	8	130.0	34.5	0.22	0.036	Falcon Field
P-100	559	J-89	J-90	8	130.0	24.8	0.16	0.019	Falcon Field
P-101	371	J-90	J-82	8	130.0	24.8	0.16	0.019	Falcon Field
P-102	361	J-84	J-91	8	130.0	29.9	0.19	0.027	Falcon Field
P-103	541	J-91	J-92	8	130.0	29.9	0.19	0.028	Falcon Field
P-104	697	J-93	J-92	8	130.0	74.5	0.48	0.149	Falcon Field
P-105	814	J-36	J-93	8	130.0	121.0	0.77	0.366	Falcon Field
P-107	537	J-95	J-89	8	130.0	28.7	0.18	0.025	Falcon Field
P-108	372	J-81	J-95	8	130.0	28.7	0.18	0.025	Falcon Field
P-109	401	J-96	J-81	8	130.0	7.5	0.05	0.002	Falcon Field
P-110	544	J-97	J-96	8	130.0	7.5	0.05	0.002	Falcon Field
P-111	548	J-98	J-97	8	130.0	15.0	0.10	0.008	Falcon Field
P-112	378	J-82	J-98	8	130.0	15.0	0.10	0.008	Falcon Field
P-113	316	J-97	J-99	8	130.0	41.5	0.26	0.050	Falcon Field
P-113	540	J-85	J-38	8	130.0	46.1	0.29	0.061	Falcon Field
P-114	326	J-99	J-49	8	130.0	84.3	0.54	0.187	Falcon Field
P-114	300	J-101	J-105	8	130.0	16.8	0.11	0.009	Falcon Field
P-115	383	J-100	J-84	8	130.0	16.0	0.10	0.009	Falcon Field
P-115	345	J-105	J-47	8	130.0	0.5	0.00	0.000	Falcon Field
P-116	562	J-101	J-100	8	130.0	16.0	0.10	0.009	Falcon Field
P-116	662	J-47	J-107	12	130.0	102.6	0.29	0.037	Falcon Field
P-117	543	J-102	J-101	8	130.0	29.7	0.19	0.027	Falcon Field
P-118	391	J-85	J-102	8	130.0	29.7	0.19	0.027	Falcon Field
P-118	981	J-107	J-108	12	130.0	6.6	0.02	0.000	Falcon Field
P-119	342	J-103	J-85	8	130.0	15.7	0.10	0.008	Falcon Field
P-120	590	J-92	J-103	8	130.0	15.7	0.10	0.008	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-123	1,124	J-43	J-108	12	130.0	28.6	0.08	0.003	Falcon Field
P-126	2,226	J-38	J-44	8	130.0	32.2	0.21	0.031	Falcon Field
P-127	1,743	J-44	J-43	8	130.0	14.1	0.09	0.007	Falcon Field
P-900	231	R-1	PMP-1	48	130.0	2,048.9	0.36	0.012	Falcon Field
P-901	234	PMP-1	J-34	48	130.0	2,048.9	0.36	0.012	Falcon Field

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gal/min)	Pump Head (ft)
PMP-1	1,350.00	1,350.10	1,517.30	2,048.9	167.20

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gal/min)	Hydraulic Grade (ft)
R-1	1,350.10	2,048.9	1,350.10

PEAK HOUR DEMAND

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-1	1,352.00	0.0	1,501.38	64.6	Falcon Field
J-2	1,367.44	0.0	1,501.01	57.8	Falcon Field
J-3	1,368.90	0.0	1,501.00	57.2	Falcon Field
J-4	1,367.00	0.0	1,500.98	58.0	Falcon Field
J-5	1,377.00	0.0	1,500.92	53.6	Falcon Field
J-6	1,391.56	0.0	1,500.91	47.3	Falcon Field
J-7	1,383.17	0.0	1,500.84	50.9	Falcon Field
J-9	1,380.00	37.6	1,500.81	52.3	Falcon Field
J-10	1,377.00	42.9	1,500.81	53.6	Falcon Field
J-11	1,376.00	66.4	1,500.82	54.0	Falcon Field
J-12	1,376.00	0.0	1,500.87	54.0	Falcon Field
J-14	1,372.00	0.0	1,500.89	55.8	Falcon Field
J-15	1,370.00	0.0	1,500.91	56.6	Falcon Field
J-16	1,366.94	0.0	1,500.99	58.0	Falcon Field
J-17	1,363.00	0.0	1,501.07	59.7	Falcon Field
J-18	1,363.00	0.0	1,500.74	59.6	Falcon Field
J-19	1,364.55	75.0	1,500.74	58.9	Falcon Field
J-20	1,368.42	28.6	1,500.70	57.2	Falcon Field
J-21	1,373.74	55.0	1,500.69	54.9	Falcon Field
J-22	1,373.00	28.6	1,500.71	55.3	Falcon Field
J-23	1,375.73	29.8	1,500.71	54.1	Falcon Field
J-24	1,373.00	75.1	1,500.71	55.3	Falcon Field
J-25	1,370.00	59.4	1,500.85	56.6	Falcon Field
J-27	1,350.00	0.0	1,501.39	65.5	Falcon Field
J-28	1,353.33	0.0	1,501.26	64.0	Falcon Field
J-29	1,359.02	0.0	1,501.15	61.5	Falcon Field
J-31	1,383.00	0.0	1,500.87	51.0	Falcon Field
J-33	1,391.00	0.0	1,500.87	47.5	Falcon Field
J-34	1,350.00	0.0	1,501.67	65.6	Falcon Field
J-35	1,340.06	0.0	1,501.49	69.8	Falcon Field
J-36	1,357.76	0.0	1,498.46	60.9	Falcon Field
J-37	1,360.62	93.0	1,497.88	59.4	Falcon Field
J-38	1,363.00	29.8	1,497.70	58.3	Falcon Field
J-39	1,366.07	118.0	1,497.58	56.9	Falcon Field
J-40	1,368.59	0.0	1,497.56	55.8	Falcon Field
J-42	1,371.11	97.8	1,497.52	54.7	Falcon Field
J-43	1,374.74	0.0	1,497.52	53.1	Falcon Field
J-44	1,370.19	76.3	1,497.55	55.1	Falcon Field
J-45	1,369.92	0.0	1,497.55	55.2	Falcon Field
J-47	1,371.00	0.0	1,497.57	54.8	Falcon Field
J-48	1,371.96	0.0	1,497.64	54.4	Falcon Field
J-49	1,372.00	0.0	1,497.72	54.4	Falcon Field
J-50	1,375.00	0.0	1,497.95	53.2	Falcon Field
J-51	1,375.00	0.0	1,498.18	53.3	Falcon Field
J-53	1,372.25	0.0	1,499.04	54.9	Falcon Field
J-56	1,361.52	74.3	1,498.15	59.1	Falcon Field
J-57	1,365.51	0.0	1,498.39	57.5	Falcon Field
J-58	1,366.52	39.2	1,498.82	57.2	Falcon Field
J-59	1,366.00	0.0	1,499.08	57.6	Falcon Field
J-60	1,369.00	39.2	1,499.05	56.3	Falcon Field
J-61	1,372.26	67.4	1,499.04	54.9	Falcon Field
J-62	1,376.66	71.8	1,498.70	52.8	Falcon Field
J-63	1,380.00	56.2	1,498.47	51.3	Falcon Field
J-64	1,382.00	215.3	1,498.20	50.3	Falcon Field
J-65	1,376.69	104.4	1,498.18	52.6	Falcon Field
J-66	1,375.62	77.8	1,497.96	52.9	Falcon Field

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-67	1,373.00	40.0	1,497.82	54.0	Falcon Field
J-68	1,368.17	29.8	1,497.79	56.1	Falcon Field
J-69	1,368.00	40.0	1,497.75	56.1	Falcon Field
J-70	1,362.29	0.0	1,497.74	58.6	Falcon Field
J-71	1,359.87	0.0	1,497.73	59.6	Falcon Field
J-72	1,358.04	78.1	1,497.73	60.4	Falcon Field
J-73	1,356.56	54.3	1,497.83	61.1	Falcon Field
J-74	1,357.00	110.0	1,498.04	61.0	Falcon Field
J-75	1,359.00	23.8	1,498.10	60.2	Falcon Field
J-76	1,361.45	28.0	1,498.01	59.1	Falcon Field
J-77	1,359.92	28.0	1,497.80	59.7	Falcon Field
J-78	1,368.00	70.9	1,498.50	56.5	Falcon Field
J-79	1,367.89	70.9	1,497.95	56.3	Falcon Field
J-80	1,367.99	53.3	1,497.61	56.1	Falcon Field
J-81	1,366.00	0.0	1,497.56	56.9	Falcon Field
J-82	1,365.89	29.8	1,497.56	57.0	Falcon Field
J-83	1,367.21	34.4	1,497.56	56.4	Falcon Field
J-84	1,367.00	0.0	1,497.59	56.5	Falcon Field
J-85	1,363.00	0.0	1,497.63	58.2	Falcon Field
J-87	1,359.50	54.3	1,497.52	59.7	Falcon Field
J-88	1,361.00	108.7	1,497.46	59.0	Falcon Field
J-89	1,362.85	28.6	1,497.51	58.3	Falcon Field
J-90	1,364.00	0.0	1,497.54	57.8	Falcon Field
J-91	1,365.00	0.0	1,497.61	57.4	Falcon Field
J-92	1,362.66	43.3	1,497.64	58.4	Falcon Field
J-93	1,359.45	69.8	1,497.85	59.9	Falcon Field
J-95	1,364.00	0.0	1,497.54	57.8	Falcon Field
J-96	1,370.00	0.0	1,497.57	55.2	Falcon Field
J-97	1,369.23	28.6	1,497.57	55.5	Falcon Field
J-98	1,367.89	0.0	1,497.56	56.1	Falcon Field
J-99	1,372.00	64.3	1,497.60	54.3	Falcon Field
J-100	1,367.00	0.0	1,497.59	56.5	Falcon Field
J-101	1,368.12	43.3	1,497.57	56.0	Falcon Field
J-102	1,364.04	0.0	1,497.61	57.8	Falcon Field
J-103	1,362.00	0.0	1,497.63	58.7	Falcon Field
J-105	1,370.15	25.9	1,497.57	55.1	Falcon Field
J-107	1,376.39	143.9	1,497.51	52.4	Falcon Field
J-108	1,376.50	52.8	1,497.51	52.4	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-1	2,656	J-2	J-1	12	130.0	209.0	0.59	0.140	Falcon Field
P-2	293	J-3	J-2	12	130.0	88.4	0.25	0.028	Falcon Field
P-3	818	J-4	J-3	12	130.0	88.4	0.25	0.028	Falcon Field
P-4	2,020	J-5	J-4	12	130.0	88.4	0.25	0.028	Falcon Field
P-5	2,157	J-6	J-5	16	130.0	88.4	0.14	0.007	Falcon Field
P-6	2,381	J-6	J-7	12	130.0	88.4	0.25	0.028	Falcon Field
P-7	977	J-9	J-7	12	130.0	88.4	0.25	0.028	Falcon Field
P-9	801	J-10	J-9	12	130.0	24.4	0.07	0.003	Falcon Field
P-10	390	J-11	J-10	12	130.0	67.2	0.19	0.017	Falcon Field
P-11	725	J-12	J-11	12	130.0	133.6	0.38	0.061	Falcon Field
P-12	613	J-14	J-12	30	130.0	1,064.6	0.48	0.033	Falcon Field
P-14	689	J-15	J-14	30	130.0	1,064.6	0.48	0.033	Falcon Field
P-15	644	J-15	J-16	30	130.0	2,153.3	0.98	0.121	Falcon Field
P-16	710	J-16	J-17	30	130.0	2,153.3	0.98	0.121	Falcon Field
P-18	700	J-19	J-18	8	130.0	0.0	0.00	0.000	Falcon Field
P-19	733	J-2	J-19	8	130.0	120.6	0.77	0.363	Falcon Field
P-20	687	J-19	J-20	8	130.0	45.6	0.29	0.060	Falcon Field
P-21	944	J-21	J-20	8	130.0	24.2	0.15	0.018	Falcon Field
P-22	927	J-22	J-21	8	130.0	30.8	0.20	0.029	Falcon Field
P-23	656	J-9	J-22	8	130.0	75.2	0.48	0.151	Falcon Field
P-24	923	J-20	J-23	8	130.0	7.1	0.05	0.002	Falcon Field
P-24	925	J-23	J-22	8	130.0	15.7	0.10	0.008	Falcon Field
P-25	326	J-23	J-24	8	130.0	21.2	0.14	0.015	Falcon Field
P-26	583	J-24	J-25	8	130.0	96.3	0.61	0.240	Falcon Field
P-27	721	J-25	J-15	12	130.0	155.7	0.44	0.081	Falcon Field
P-28	2,614	J-1	J-27	24	130.0	209.0	0.15	0.005	Falcon Field
P-29	1,110	J-28	J-27	30	130.0	2,153.3	0.98	0.121	Falcon Field
P-30	907	J-29	J-28	30	130.0	2,153.3	0.98	0.121	Falcon Field
P-31	650	J-29	J-17	30	130.0	2,153.3	0.98	0.121	Falcon Field
P-32	1,330	J-31	J-12	42	130.0	0.0	0.00	0.000	Falcon Field
P-34	1,142	J-31	J-33	42	130.0	0.0	0.00	0.000	Falcon Field
P-36	652	J-27	J-34	24	130.0	2,362.2	1.68	0.426	Falcon Field
P-37	4,613	J-34	J-35	24	130.0	651.6	0.46	0.039	Falcon Field
P-38	2,641	J-36	J-35	12	130.0	651.6	1.85	1.147	Falcon Field
P-39	918	J-37	J-36	12	130.0	473.1	1.34	0.634	Falcon Field
P-40	429	J-38	J-37	12	130.0	380.1	1.08	0.422	Falcon Field
P-41	687	J-38	J-39	12	130.0	231.3	0.66	0.168	Falcon Field
P-42	622	J-39	J-40	12	130.0	113.3	0.32	0.045	Falcon Field
P-43	658	J-42	J-40	12	130.0	119.9	0.34	0.050	Falcon Field
P-45	657	J-42	J-43	12	130.0	22.1	0.06	0.002	Falcon Field
P-46	492	J-45	J-44	12	130.0	48.7	0.14	0.009	Falcon Field
P-47	414	J-40	J-45	12	130.0	48.7	0.14	0.009	Falcon Field
P-48	811	J-40	J-47	12	130.0	55.3	0.16	0.012	Falcon Field
P-50	541	J-47	J-48	12	130.0	206.7	0.59	0.137	Falcon Field
P-51	553	J-48	J-49	12	130.0	206.7	0.59	0.137	Falcon Field
P-52	719	J-49	J-50	12	130.0	328.0	0.93	0.322	Falcon Field
P-53	738	J-50	J-51	12	130.0	328.0	0.93	0.322	Falcon Field
P-54	1,093	J-51	J-53	12	130.0	530.3	1.50	0.783	Falcon Field
P-56	822	J-12	J-53	12	130.0	931.0	2.64	2.221	Falcon Field
P-58	822	J-59	J-15	12	130.0	932.9	2.65	2.229	Falcon Field
P-60	369	J-56	J-57	12	130.0	479.7	1.36	0.650	Falcon Field
P-61	647	J-58	J-57	12	130.0	479.7	1.36	0.650	Falcon Field
P-62	346	J-59	J-58	12	130.0	518.9	1.47	0.752	Falcon Field
P-63	401	J-60	J-59	12	130.0	122.5	0.35	0.052	Falcon Field
P-64	554	J-61	J-60	12	130.0	83.4	0.24	0.025	Falcon Field
P-65	349	J-53	J-61	12	130.0	16.0	0.05	0.001	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-66	675	J-53	J-62	12	130.0	416.8	1.18	0.501	Falcon Field
P-67	648	J-62	J-63	12	130.0	345.0	0.98	0.353	Falcon Field
P-68	1,093	J-64	J-63	12	130.0	288.7	0.82	0.254	Falcon Field
P-69	659	J-65	J-64	12	130.0	73.4	0.21	0.020	Falcon Field
P-70	651	J-51	J-65	12	130.0	31.0	0.09	0.004	Falcon Field
P-71	328	J-66	J-51	8	130.0	171.3	1.09	0.696	Falcon Field
P-72	586	J-67	J-66	8	130.0	93.5	0.60	0.226	Falcon Field
P-73	391	J-68	J-67	8	130.0	53.5	0.34	0.081	Falcon Field
P-74	340	J-69	J-68	8	130.0	65.5	0.42	0.117	Falcon Field
P-75	663	J-70	J-69	8	130.0	25.5	0.16	0.020	Falcon Field
P-76	361	J-71	J-70	8	130.0	25.5	0.16	0.021	Falcon Field
P-78	321	J-71	J-72	8	130.0	12.4	0.08	0.005	Falcon Field
P-79	866	J-73	J-72	8	130.0	65.8	0.42	0.118	Falcon Field
P-80	567	J-73	J-74	8	130.0	120.1	0.77	0.360	Falcon Field
P-81	361	J-74	J-75	12	130.0	230.1	0.65	0.167	Falcon Field
P-82	288	J-75	J-56	12	130.0	253.9	0.72	0.200	Falcon Field
P-83	258	J-76	J-56	8	130.0	151.5	0.97	0.554	Falcon Field
P-84	565	J-77	J-76	8	130.0	123.4	0.79	0.379	Falcon Field
P-85	278	J-71	J-77	8	130.0	95.4	0.61	0.235	Falcon Field
P-86	309	J-78	J-59	8	130.0	291.5	1.86	1.863	Falcon Field
P-87	493	J-79	J-78	8	130.0	220.6	1.41	1.112	Falcon Field
P-88	295	J-68	J-79	8	130.0	149.7	0.96	0.542	Falcon Field
P-89	608	J-68	J-80	8	130.0	107.9	0.69	0.296	Falcon Field
P-90	577	J-80	J-81	8	130.0	54.6	0.35	0.084	Falcon Field
P-91	548	J-82	J-81	8	130.0	20.6	0.13	0.014	Falcon Field
P-92	283	J-82	J-83	8	130.0	29.9	0.19	0.027	Falcon Field
P-93	260	J-83	J-84	8	130.0	64.3	0.41	0.113	Falcon Field
P-94	547	J-85	J-84	8	130.0	47.0	0.30	0.064	Falcon Field
P-97	719	J-87	J-71	8	130.0	108.5	0.69	0.298	Falcon Field
P-98	752	J-87	J-88	8	130.0	54.1	0.35	0.082	Falcon Field
P-99	705	J-88	J-89	8	130.0	54.5	0.35	0.084	Falcon Field
P-100	559	J-89	J-90	8	130.0	39.5	0.25	0.046	Falcon Field
P-101	371	J-90	J-82	8	130.0	39.5	0.25	0.046	Falcon Field
P-102	361	J-84	J-91	8	130.0	43.3	0.28	0.055	Falcon Field
P-103	541	J-91	J-92	8	130.0	43.3	0.28	0.055	Falcon Field
P-104	697	J-93	J-92	8	130.0	108.7	0.69	0.300	Falcon Field
P-105	814	J-36	J-93	8	130.0	178.5	1.14	0.751	Falcon Field
P-107	537	J-95	J-89	8	130.0	43.6	0.28	0.055	Falcon Field
P-108	372	J-81	J-95	8	130.0	43.6	0.28	0.055	Falcon Field
P-109	401	J-96	J-81	8	130.0	9.7	0.06	0.003	Falcon Field
P-110	544	J-97	J-96	8	130.0	9.7	0.06	0.003	Falcon Field
P-111	548	J-98	J-97	8	130.0	18.8	0.12	0.012	Falcon Field
P-112	378	J-82	J-98	8	130.0	18.8	0.12	0.012	Falcon Field
P-113	316	J-97	J-99	8	130.0	57.1	0.36	0.091	Falcon Field
P-113	540	J-85	J-38	8	130.0	70.1	0.45	0.133	Falcon Field
P-114	326	J-99	J-49	8	130.0	121.3	0.77	0.367	Falcon Field
P-114	300	J-101	J-105	8	130.0	27.9	0.18	0.024	Falcon Field
P-115	383	J-100	J-84	8	130.0	26.1	0.17	0.021	Falcon Field
P-115	345	J-105	J-47	8	130.0	2.0	0.01	0.000	Falcon Field
P-116	562	J-101	J-100	8	130.0	26.1	0.17	0.021	Falcon Field
P-116	662	J-47	J-107	12	130.0	153.3	0.43	0.079	Falcon Field
P-117	543	J-102	J-101	8	130.0	45.1	0.29	0.059	Falcon Field
P-118	391	J-85	J-102	8	130.0	45.1	0.29	0.059	Falcon Field
P-118	981	J-107	J-108	12	130.0	9.4	0.03	0.000	Falcon Field
P-119	342	J-103	J-85	8	130.0	22.0	0.14	0.015	Falcon Field
P-120	590	J-92	J-103	8	130.0	22.0	0.14	0.016	Falcon Field

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-123	1,124	J-43	J-108	12	130.0	43.5	0.12	0.008	Falcon Field
P-126	2,226	J-38	J-44	8	130.0	48.9	0.31	0.068	Falcon Field
P-127	1,743	J-44	J-43	8	130.0	21.4	0.14	0.015	Falcon Field
P-900	231	R-1	PMP-1	48	130.0	3,013.8	0.53	0.025	Falcon Field
P-901	234	PMP-1	J-34	48	130.0	3,013.8	0.53	0.024	Falcon Field

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gal/min)	Pump Head (ft)
PMP-1	1,350.00	1,350.10	1,501.67	3,013.8	151.57

Label	Elevation (ft)	Flow (Out net) (gal/min)	Hydraulic Grade (ft)
R-1	1,350.10	3,013.8	1,350.10

MAXIMUM DAY DEMAND PLUS FIRE FLOW

RESIDUAL PRESSURE ANALYSIS

AVAILABLE FIRE FLOW ANALYSIS

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-1	0.0	3,000.0	3,000.0	3,001.0	3,001.0	42.5	25.6	J-6	P-36	3.22	True
J-2	0.0	3,000.0	3,000.0	3,001.0	3,001.0	28.7	21.0	J-6	P-1	4.74	True
J-3	0.0	1,500.0	1,500.0	1,501.0	1,501.0	50.0	40.9	J-6	P-2	3.03	True
J-4	0.0	1,500.0	1,500.0	1,501.0	1,501.0	50.2	40.5	J-6	P-2	2.77	True
J-5	0.0	1,500.0	1,500.0	1,501.0	1,501.0	45.3	39.3	J-6	P-2	2.21	True
J-6	0.0	1,500.0	1,500.0	1,501.0	1,501.0	39.0	42.7	J-33	P-11	2.21	True
J-7	0.0	1,500.0	1,500.0	1,501.0	1,501.0	43.5	40.5	J-6	P-7	2.87	True
J-9	25.0	1,500.0	1,525.0	1,501.0	1,526.0	45.7	41.2	J-6	P-11	2.70	True
J-10	28.6	1,500.0	1,528.6	1,501.0	1,529.6	47.3	41.7	J-6	P-11	3.08	True
J-11	44.2	3,000.0	3,044.2	3,001.0	3,045.2	28.6	23.6	J-6	P-11	6.37	True
J-12	0.0	3,000.0	3,000.0	3,001.0	3,001.0	32.0	25.5	J-6	P-36	3.15	True
J-14	0.0	3,000.0	3,000.0	3,001.0	3,001.0	33.8	25.5	J-6	P-36	3.15	True
J-15	0.0	3,000.0	3,000.0	3,001.0	3,001.0	34.7	25.5	J-6	P-36	3.16	True
J-16	0.0	3,000.0	3,000.0	3,001.0	3,001.0	36.1	25.6	J-6	P-36	3.17	True
J-17	0.0	3,000.0	3,000.0	3,001.0	3,001.0	38.0	25.7	J-6	P-36	3.18	True
J-18	0.0	1,500.0	1,500.0	1,501.0	1,501.0	37.3	41.4	J-6	P-18	9.58	True
J-19	50.0	1,500.0	1,550.0	1,501.0	1,551.0	48.4	41.4	J-6	P-19	5.61	True
J-20	19.0	1,500.0	1,519.0	1,501.0	1,520.0	47.3	41.6	J-6	P-19	3.95	True
J-21	36.7	1,500.0	1,536.7	1,501.0	1,537.7	42.3	41.7	J-6	P-22	5.09	True
J-22	19.0	1,500.0	1,519.0	1,501.0	1,520.0	46.3	41.6	J-6	P-23	4.91	True
J-23	29.8	1,500.0	1,529.8	1,501.0	1,530.8	45.2	41.8	J-6	P-26	4.55	True
J-24	50.1	1,500.0	1,550.1	1,501.0	1,551.1	46.3	42.0	J-6	P-26	5.54	True
J-25	39.6	3,000.0	3,039.6	3,001.0	3,040.6	30.4	25.2	J-6	P-27	7.14	True
J-27	0.0	3,000.0	3,000.0	3,001.0	3,001.0	44.0	26.0	J-6	P-36	3.22	True
J-28	0.0	3,000.0	3,000.0	3,001.0	3,001.0	42.4	25.8	J-6	P-36	3.20	True
J-29	0.0	3,000.0	3,000.0	3,001.0	3,001.0	39.8	25.7	J-6	P-36	3.19	True
J-31	0.0	3,000.0	3,000.0	3,001.0	3,001.0	28.9	25.5	J-33	P-36	3.15	True
J-33	0.0	3,000.0	3,000.0	3,001.0	3,001.0	25.4	25.5	J-6	P-36	3.15	True
J-34	0.0	3,000.0	3,000.0	3,001.0	3,001.0	44.5	26.3	J-6	P-58	1.79	True
J-35	0.0	3,000.0	3,000.0	3,001.0	3,001.0	47.3	26.3	J-6	P-37	2.23	True
J-36	0.0	3,000.0	3,000.0	3,001.0	3,001.0	31.6	25.3	J-108	P-38	5.22	True
J-37	62.0	3,000.0	3,062.0	3,001.0	3,063.0	29.1	24.2	J-108	P-38	4.85	True
J-38	29.8	3,000.0	3,029.8	3,001.0	3,030.8	28.2	23.8	J-108	P-38	4.70	True
J-39	78.7	3,000.0	3,078.7	3,001.0	3,079.7	25.8	23.2	J-108	P-38	4.58	True
J-40	0.0	3,000.0	3,000.0	3,001.0	3,001.0	25.3	22.5	J-108	P-56	4.51	True
J-42	65.2	3,000.0	3,065.2	3,001.0	3,066.2	22.1	21.4	J-43	P-43	5.49	True
J-43	0.0	3,000.0	3,000.0	3,000.7	3,000.7	20.0	20.6	J-108	P-56	4.54	True

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-44	50.8	3,000.0	3,050.8	3,001.0	3,051.8	21.2	22.6	J-108	P-46	5.80	True
J-45	0.0	3,000.0	3,000.0	3,001.0	3,001.0	22.8	22.5	J-108	P-47	6.52	True
J-47	0.0	3,000.0	3,000.0	3,001.0	3,001.0	24.9	22.6	J-107	P-56	4.58	True
J-48	0.0	3,000.0	3,000.0	3,001.0	3,001.0	24.9	23.8	J-107	P-51	5.19	True
J-49	0.0	3,000.0	3,000.0	3,001.0	3,001.0	25.9	25.0	J-107	P-56	4.81	True
J-50	0.0	3,000.0	3,000.0	3,001.0	3,001.0	25.4	25.6	J-64	P-53	5.53	True
J-51	0.0	3,000.0	3,000.0	3,001.0	3,001.0	27.3	24.9	J-64	P-56	5.30	True
J-53	0.0	3,000.0	3,000.0	3,001.0	3,001.0	30.5	25.7	J-6	P-56	5.81	True
J-56	49.6	3,000.0	3,049.6	3,001.0	3,050.6	28.1	25.7	J-6	P-62	6.66	True
J-57	0.0	3,000.0	3,000.0	3,001.0	3,001.0	27.8	25.7	J-6	P-62	6.98	True
J-58	26.1	3,000.0	3,026.1	3,001.0	3,027.1	30.4	25.6	J-6	P-62	7.79	True
J-59	0.0	3,000.0	3,000.0	3,001.0	3,001.0	33.0	25.6	J-6	P-58	5.99	True
J-60	26.1	3,000.0	3,026.1	3,001.0	3,027.1	30.9	25.6	J-6	P-58	5.57	True
J-61	44.9	3,000.0	3,044.9	3,001.0	3,045.9	29.6	25.6	J-6	P-56	5.47	True
J-62	47.9	3,000.0	3,047.8	3,001.0	3,048.8	25.4	24.4	J-63	P-66	6.34	True
J-63	37.5	3,000.0	3,037.5	3,001.0	3,038.5	22.5	23.2	J-64	P-56	5.63	True
J-64	143.5	3,000.0	3,143.5	3,001.0	3,144.5	21.2	24.4	J-63	P-56	5.50	True
J-65	69.6	3,000.0	3,069.6	3,001.0	3,070.6	24.5	23.0	J-64	P-70	5.80	True
J-66	51.9	1,500.0	1,551.9	1,501.0	1,552.9	44.5	42.6	J-6	P-71	6.60	True
J-67	26.7	1,500.0	1,526.7	1,501.0	1,527.7	44.9	42.6	J-6	P-73	5.47	True
J-68	29.8	1,500.0	1,529.8	1,501.0	1,530.8	48.6	42.5	J-6	P-86	3.72	True
J-69	26.7	1,500.0	1,526.7	1,501.0	1,527.7	46.7	42.5	J-6	P-74	6.17	True
J-70	0.0	1,500.0	1,500.0	1,501.0	1,501.0	48.7	42.5	J-6	P-76	5.46	True
J-71	0.0	1,500.0	1,500.0	1,501.0	1,501.0	51.1	42.5	J-6	P-58	3.55	True
J-72	52.1	1,500.0	1,552.1	1,501.0	1,553.1	49.8	42.5	J-6	P-78	6.52	True
J-73	36.2	1,500.0	1,536.2	1,501.0	1,537.2	49.7	42.5	J-6	P-80	5.78	True
J-74	73.4	3,000.0	3,073.4	3,001.0	3,074.4	26.6	25.7	J-6	P-82	7.19	True
J-75	15.9	3,000.0	3,015.9	3,001.0	3,016.9	27.6	25.7	J-6	P-82	7.49	True
J-76	18.7	1,500.0	1,518.7	1,501.0	1,519.7	49.8	42.5	J-6	P-83	6.42	True
J-77	18.7	1,500.0	1,518.7	1,501.0	1,519.7	50.0	42.5	J-6	P-85	5.54	True
J-78	47.3	1,500.0	1,547.3	1,501.0	1,548.3	48.5	42.5	J-6	P-86	6.83	True
J-79	47.3	1,500.0	1,547.3	1,501.0	1,548.3	47.7	42.5	J-6	P-88	5.26	True
J-80	35.6	1,500.0	1,535.6	1,501.0	1,536.6	46.5	42.6	J-6	P-89	5.08	True
J-81	0.0	1,500.0	1,500.0	1,501.0	1,501.0	48.8	42.6	J-6	P-58	3.32	True
J-82	29.8	1,500.0	1,529.8	1,501.0	1,530.8	48.9	42.6	J-6	P-93	3.66	True
J-83	22.9	1,500.0	1,522.9	1,501.0	1,523.9	47.9	42.6	J-6	P-93	4.98	True
J-84	0.0	1,500.0	1,500.0	1,501.0	1,501.0	48.5	42.6	J-6	P-92	3.49	True

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-85	0.0	1,500.0	1,500.0	1,501.0	1,501.0	50.2	42.6	J-6	P-113	3.46	True
J-87	36.2	1,500.0	1,536.2	1,501.0	1,537.2	47.4	42.6	J-6	P-97	5.94	True
J-88	72.4	1,500.0	1,572.4	1,501.0	1,573.4	46.3	42.6	J-6	P-99	5.65	True
J-89	19.0	1,500.0	1,519.0	1,501.0	1,520.0	48.5	42.6	J-6	P-107	3.66	True
J-90	0.0	1,500.0	1,500.0	1,501.0	1,501.0	47.8	42.6	J-6	P-101	5.76	True
J-91	0.0	1,500.0	1,500.0	1,501.0	1,501.0	47.6	42.6	J-6	P-102	5.61	True
J-92	28.9	1,500.0	1,528.9	1,501.0	1,529.9	49.0	42.6	J-6	P-103	3.40	True
J-93	46.6	1,500.0	1,546.6	1,501.0	1,547.6	48.9	42.6	J-6	P-105	5.28	True
J-95	0.0	1,500.0	1,500.0	1,501.0	1,501.0	47.8	42.6	J-6	P-108	5.69	True
J-96	0.0	1,500.0	1,500.0	1,501.0	1,501.0	45.4	42.6	J-6	P-109	5.20	True
J-97	19.0	1,500.0	1,519.0	1,501.0	1,520.0	46.9	42.6	J-6	P-114	4.46	True
J-98	0.0	1,500.0	1,500.0	1,501.0	1,501.0	46.4	42.6	J-6	P-112	5.30	True
J-99	42.9	1,500.0	1,542.9	1,501.0	1,543.9	45.8	42.6	J-6	P-114	5.89	True
J-100	0.0	1,500.0	1,500.0	1,501.0	1,501.0	46.7	42.6	J-6	P-115	5.43	True
J-101	28.9	1,500.0	1,528.9	1,501.0	1,529.9	47.2	42.6	J-6	P-115	4.05	True
J-102	0.0	1,500.0	1,500.0	1,501.0	1,501.0	48.0	42.6	J-6	P-118	5.38	True
J-103	0.0	1,500.0	1,500.0	1,501.0	1,501.0	48.9	42.6	J-6	P-119	5.73	True
J-105	17.3	1,500.0	1,517.3	1,501.0	1,518.3	46.2	42.6	J-6	P-115	5.50	True
J-107	96.0	1,500.0	1,596.0	1,501.0	1,597.0	44.4	42.6	J-6	P-56	3.19	True
J-108	35.2	3,000.0	3,035.2	2,917.2	2,952.4	18.4	20.9	J-107	P-116	4.64	False

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-1	0.0	3,000.0	3,000.0	3,419.0	3,419.0	42.5	25.6	J-6	P-36	3.51	True
J-2	0.0	3,000.0	3,000.0	3,060.3	3,060.3	28.7	21.0	J-6	P-1	4.83	True
J-3	0.0	1,500.0	1,500.0	3,019.2	3,019.2	50.0	40.9	J-6	P-2	6.06	True
J-4	0.0	1,500.0	1,500.0	2,918.7	2,918.7	50.2	40.5	J-6	P-2	5.34	True
J-5	0.0	1,500.0	1,500.0	2,714.2	2,714.2	45.3	39.3	J-6	P-2	3.97	True
J-6	0.0	1,500.0	1,500.0	2,663.5	2,663.5	39.0	42.7	J-33	P-6	3.90	True
J-7	0.0	1,500.0	1,500.0	2,934.1	2,934.1	43.5	40.5	J-6	P-7	5.65	True
J-9	25.0	1,500.0	1,525.0	3,088.1	3,113.2	45.7	41.2	J-6	P-11	5.24	True
J-10	28.6	1,500.0	1,528.6	3,194.4	3,223.0	47.3	41.7	J-6	P-11	6.25	True
J-11	44.2	3,000.0	3,044.2	3,253.5	3,297.8	28.6	23.6	J-6	P-11	6.88	True
J-12	0.0	3,000.0	3,000.0	3,404.7	3,404.7	32.0	25.5	J-6	P-36	3.41	True
J-14	0.0	3,000.0	3,000.0	3,410.1	3,410.1	33.8	25.5	J-6	P-36	3.42	True
J-15	0.0	3,000.0	3,000.0	3,413.2	3,413.2	34.7	25.5	J-6	P-36	3.43	True
J-16	0.0	3,000.0	3,000.0	3,418.1	3,418.1	36.1	25.6	J-6	P-36	3.44	True
J-17	0.0	3,000.0	3,000.0	3,424.2	3,424.2	38.0	25.7	J-6	P-36	3.46	True
J-18	0.0	1,500.0	1,500.0	1,566.7	1,566.7	37.3	41.4	J-6	P-18	10.00	True
J-19	50.0	1,500.0	1,550.0	2,752.0	2,802.0	48.4	41.4	J-6	P-19	10.00	True
J-20	19.0	1,500.0	1,519.0	2,920.1	2,939.2	47.3	41.6	J-6	P-19	7.30	True
J-21	36.7	1,500.0	1,536.7	2,499.3	2,535.9	42.3	41.7	J-6	P-22	8.37	True
J-22	19.0	1,500.0	1,519.0	2,973.4	2,992.4	46.3	41.6	J-6	P-23	9.45	True
J-23	29.8	1,500.0	1,529.8	2,931.5	2,961.3	45.2	41.8	J-6	P-26	8.48	True
J-24	50.1	1,500.0	1,550.1	2,794.3	2,844.4	46.3	42.0	J-6	P-26	10.00	True
J-25	39.6	3,000.0	3,039.6	3,387.6	3,427.1	30.4	25.2	J-6	P-27	8.03	True
J-27	0.0	3,000.0	3,000.0	3,449.7	3,449.7	44.0	26.0	J-6	P-36	3.53	True
J-28	0.0	3,000.0	3,000.0	3,439.0	3,439.0	42.4	25.8	J-6	P-36	3.50	True
J-29	0.0	3,000.0	3,000.0	3,430.5	3,430.5	39.8	25.7	J-6	P-36	3.48	True
J-31	0.0	3,000.0	3,000.0	3,402.4	3,402.4	28.9	25.5	J-33	P-36	3.41	True
J-33	0.0	3,000.0	3,000.0	3,400.5	3,400.5	25.4	25.5	J-6	P-36	3.41	True
J-34	0.0	3,000.0	3,000.0	3,480.1	3,480.1	44.5	26.3	J-6	P-58	1.79	True
J-35	0.0	3,000.0	3,000.0	3,475.0	3,475.0	47.3	26.3	J-6	P-37	2.51	True
J-36	0.0	3,000.0	3,000.0	3,324.7	3,324.7	31.6	25.3	J-108	P-38	5.67	True
J-37	62.0	3,000.0	3,062.0	3,251.2	3,313.2	29.1	24.2	J-108	P-38	5.16	True
J-38	29.8	3,000.0	3,029.8	3,220.4	3,250.2	28.2	23.8	J-108	P-38	4.97	True
J-39	78.7	3,000.0	3,078.7	3,183.2	3,261.9	25.8	23.2	J-108	P-38	4.79	True
J-40	0.0	3,000.0	3,000.0	3,141.0	3,141.0	25.3	22.5	J-108	P-56	4.64	True
J-42	65.2	3,000.0	3,065.2	3,076.3	3,141.5	22.1	21.4	J-43	P-43	5.62	True
J-43	0.0	3,000.0	3,000.0	3,000.7	3,000.7	20.0	20.6	J-108	P-56	4.54	True

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-44	50.8	3,000.0	3,050.8	3,059.7	3,110.6	21.2	22.6	J-108	P-46	5.91	True
J-45	0.0	3,000.0	3,000.0	3,142.4	3,142.4	22.8	22.5	J-108	P-47	6.82	True
J-47	0.0	3,000.0	3,000.0	3,148.2	3,148.2	24.9	22.6	J-107	P-51	4.73	True
J-48	0.0	3,000.0	3,000.0	3,222.2	3,222.2	24.9	23.8	J-107	P-51	5.54	True
J-49	0.0	3,000.0	3,000.0	3,302.4	3,302.4	25.9	25.0	J-107	P-56	5.11	True
J-50	0.0	3,000.0	3,000.0	3,317.6	3,317.6	25.4	25.6	J-64	P-53	6.06	True
J-51	0.0	3,000.0	3,000.0	3,318.6	3,318.6	27.3	24.9	J-64	P-56	5.68	True
J-53	0.0	3,000.0	3,000.0	3,417.1	3,417.1	30.5	25.7	J-6	P-56	6.37	True
J-56	49.6	3,000.0	3,049.6	3,423.8	3,473.3	28.1	25.7	J-6	P-62	7.49	True
J-57	0.0	3,000.0	3,000.0	3,423.4	3,423.4	27.8	25.7	J-6	P-62	7.85	True
J-58	26.1	3,000.0	3,026.1	3,422.2	3,448.3	30.4	25.6	J-6	P-62	8.76	True
J-59	0.0	3,000.0	3,000.0	3,422.0	3,422.0	33.0	25.6	J-6	P-58	6.60	True
J-60	26.1	3,000.0	3,026.1	3,422.4	3,448.5	30.9	25.6	J-6	P-58	6.09	True
J-61	44.9	3,000.0	3,044.9	3,422.4	3,467.3	29.6	25.6	J-6	P-56	5.98	True
J-62	47.9	3,000.0	3,047.8	3,271.5	3,319.3	25.4	24.4	J-63	P-66	6.86	True
J-63	37.5	3,000.0	3,037.5	3,146.3	3,183.8	22.5	23.2	J-64	P-56	5.82	True
J-64	143.5	3,000.0	3,143.5	3,069.5	3,213.0	21.2	24.4	J-63	P-56	5.59	True
J-65	69.6	3,000.0	3,069.6	3,179.7	3,249.3	24.5	23.0	J-64	P-70	6.13	True
J-66	51.9	1,500.0	1,551.9	2,316.2	2,368.1	44.5	42.6	J-6	P-71	10.00	True
J-67	26.7	1,500.0	1,526.7	2,749.9	2,776.6	44.9	42.6	J-6	P-73	10.00	True
J-68	29.8	1,500.0	1,529.8	3,256.7	3,286.4	48.6	42.5	J-6	P-86	6.93	True
J-69	26.7	1,500.0	1,526.7	2,459.5	2,486.2	46.7	42.5	J-6	P-74	10.00	True
J-70	0.0	1,500.0	1,500.0	2,729.2	2,729.2	48.7	42.5	J-6	P-76	10.00	True
J-71	0.0	1,500.0	1,500.0	3,236.4	3,236.4	51.1	42.5	J-6	P-74	6.31	True
J-72	52.1	1,500.0	1,552.1	2,329.0	2,381.1	49.8	42.5	J-6	P-78	10.00	True
J-73	36.2	1,500.0	1,536.2	2,641.6	2,677.8	49.7	42.5	J-6	P-80	10.00	True
J-74	73.4	3,000.0	3,073.4	3,313.4	3,386.7	26.6	25.7	J-6	P-82	7.90	True
J-75	15.9	3,000.0	3,015.9	3,378.3	3,394.1	27.6	25.7	J-6	P-82	8.38	True
J-76	18.7	1,500.0	1,518.7	2,364.0	2,382.7	49.8	42.5	J-6	P-83	10.00	True
J-77	18.7	1,500.0	1,518.7	2,681.0	2,699.7	50.0	42.5	J-6	P-85	10.00	True
J-78	47.3	1,500.0	1,547.3	2,281.9	2,329.2	48.5	42.5	J-6	P-86	10.00	True
J-79	47.3	1,500.0	1,547.3	2,804.0	2,851.2	47.7	42.5	J-6	P-88	10.00	True
J-80	35.6	1,500.0	1,535.6	2,883.2	2,918.8	46.5	42.6	J-6	P-89	9.55	True
J-81	0.0	1,500.0	1,500.0	3,169.9	3,169.9	48.8	42.6	J-6	P-89	6.15	True
J-82	29.8	1,500.0	1,529.8	3,204.1	3,233.9	48.9	42.6	J-6	P-93	7.47	True
J-83	22.9	1,500.0	1,522.9	3,064.3	3,087.3	47.9	42.6	J-6	P-93	10.00	True
J-84	0.0	1,500.0	1,500.0	3,182.3	3,182.3	48.5	42.6	J-6	P-92	7.30	True

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-85	0.0	1,500.0	1,500.0	3,261.2	3,261.2	50.2	42.6	J-6	P-113	7.46	True
J-87	36.2	1,500.0	1,536.2	2,585.4	2,621.6	47.4	42.6	J-6	P-97	10.00	True
J-88	72.4	1,500.0	1,572.4	2,644.4	2,716.9	46.3	42.6	J-6	P-99	9.74	True
J-89	19.0	1,500.0	1,519.0	2,970.9	2,989.9	48.5	42.6	J-6	P-107	7.08	True
J-90	0.0	1,500.0	1,500.0	2,625.1	2,625.1	47.8	42.6	J-6	P-101	10.00	True
J-91	0.0	1,500.0	1,500.0	2,670.9	2,670.9	47.6	42.6	J-6	P-102	10.00	True
J-92	28.9	1,500.0	1,528.9	3,018.3	3,047.2	49.0	42.6	J-6	P-103	6.80	True
J-93	46.6	1,500.0	1,546.6	2,860.5	2,907.0	48.9	42.6	J-6	P-105	9.83	True
J-95	0.0	1,500.0	1,500.0	2,659.5	2,659.5	47.8	42.6	J-6	P-108	10.00	True
J-96	0.0	1,500.0	1,500.0	2,825.1	2,825.1	45.4	42.6	J-6	P-109	9.78	True
J-97	19.0	1,500.0	1,519.0	3,022.7	3,041.7	46.9	42.6	J-6	P-114	8.62	True
J-98	0.0	1,500.0	1,500.0	2,827.7	2,827.7	46.4	42.6	J-6	P-112	10.00	True
J-99	42.9	1,500.0	1,542.9	2,604.7	2,647.5	45.8	42.6	J-6	P-114	10.00	True
J-100	0.0	1,500.0	1,500.0	2,772.3	2,772.3	46.7	42.6	J-6	P-115	10.00	True
J-101	28.9	1,500.0	1,528.9	3,007.1	3,035.9	47.2	42.6	J-6	P-115	8.01	True
J-102	0.0	1,500.0	1,500.0	2,802.0	2,802.0	48.0	42.6	J-6	P-118	10.00	True
J-103	0.0	1,500.0	1,500.0	2,619.3	2,619.3	48.9	42.6	J-6	P-119	10.00	True
J-105	17.3	1,500.0	1,517.3	2,739.4	2,756.7	46.2	42.6	J-6	P-115	10.00	True
J-107	96.0	1,500.0	1,596.0	2,987.3	3,083.3	44.4	42.6	J-6	P-116	6.10	True
J-108	35.2	3,000.0	3,035.2	2,917.2	2,952.4	18.4	20.9	J-107	P-116	4.64	False

APPENDIX F

HYDRAULIC MODEL RESULTS

DESERT WELLS SERVICE ZONE

AVERAGE DAY DEMAND

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-500	1,389.72	0.0	1,618.75	99.1	Desert Wells
J-501	1,390.43	0.0	1,618.75	98.8	Desert Wells
J-502	1,396.95	0.0	1,618.77	96.0	Desert Wells
J-503	1,402.43	0.0	1,618.79	93.6	Desert Wells
J-504	1,404.09	0.0	1,618.79	92.9	Desert Wells
J-506	1,404.67	0.0	1,618.81	92.6	Desert Wells
J-507	1,403.04	14.4	1,618.78	93.3	Desert Wells
J-508	1,404.11	0.0	1,618.77	92.9	Desert Wells
J-509	1,401.57	18.6	1,618.76	94.0	Desert Wells
J-510	1,398.94	13.1	1,618.75	95.1	Desert Wells
J-511	1,397.71	0.0	1,618.74	95.6	Desert Wells
J-512	1,395.85	13.9	1,618.74	96.4	Desert Wells
J-513	1,392.07	13.9	1,618.73	98.1	Desert Wells
J-514	1,393.02	0.0	1,618.73	97.7	Desert Wells
J-515	1,392.18	19.2	1,618.73	98.0	Desert Wells
J-516	1,392.06	0.0	1,618.73	98.1	Desert Wells
J-518	1,384.62	0.0	1,618.73	101.3	Desert Wells
J-519	1,378.36	14.2	1,618.72	104.0	Desert Wells
J-521	1,385.93	0.0	1,618.72	100.7	Desert Wells
J-522	1,385.37	14.2	1,618.72	101.0	Desert Wells
J-524	1,388.26	29.9	1,618.72	99.7	Desert Wells
J-525	1,389.91	20.7	1,618.72	99.0	Desert Wells
J-528	1,390.26	25.5	1,618.72	98.8	Desert Wells
J-529	1,394.10	25.3	1,618.73	97.2	Desert Wells
J-531	1,394.22	0.0	1,618.73	97.1	Desert Wells
J-534	1,395.93	14.1	1,618.73	96.4	Desert Wells
J-535	1,393.88	23.3	1,618.73	97.3	Desert Wells
J-538	1,393.47	15.6	1,618.73	97.5	Desert Wells
J-539	1,389.86	0.0	1,618.73	99.0	Desert Wells

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-500	291	J-500	J-501	12	130.0	0.0	0.00	0.000	Desert Wells
P-501	954	J-501	J-502	12	130.0	76.6	0.22	0.022	Desert Wells
P-502	837	J-502	J-503	12	130.0	76.6	0.22	0.022	Desert Wells
P-504	63	J-504	J-503	16	130.0	76.6	0.12	0.004	Desert Wells
P-505	271	J-504	J-506	16	130.0	275.8	0.44	0.058	Desert Wells
P-506	419	J-504	J-507	16	130.0	199.3	0.32	0.031	Desert Wells
P-507	408	J-507	J-508	16	130.0	184.9	0.30	0.027	Desert Wells
P-508	539	J-508	J-509	16	130.0	146.9	0.23	0.018	Desert Wells
P-509	713	J-509	J-510	16	130.0	128.3	0.20	0.014	Desert Wells
P-510	584	J-510	J-511	16	130.0	115.2	0.18	0.011	Desert Wells
P-511	542	J-511	J-512	16	130.0	91.3	0.15	0.007	Desert Wells
P-512	787	J-512	J-513	16	130.0	77.4	0.12	0.005	Desert Wells
P-513	482	J-513	J-514	16	130.0	63.6	0.10	0.004	Desert Wells
P-514	405	J-514	J-515	16	130.0	48.7	0.08	0.002	Desert Wells
P-515	400	J-515	J-516	16	130.0	29.5	0.05	0.001	Desert Wells
P-516	1,299	J-516	J-518	12	130.0	29.5	0.08	0.004	Desert Wells
P-518	1,432	J-518	J-519	12	130.0	14.2	0.04	0.001	Desert Wells
P-519	804	J-521	J-518	12	130.0	15.3	0.04	0.001	Desert Wells
P-521	502	J-522	J-521	12	130.0	35.9	0.10	0.005	Desert Wells
P-523	961	J-524	J-522	12	130.0	21.7	0.06	0.002	Desert Wells
P-525	851	J-525	J-524	12	130.0	8.2	0.02	0.000	Desert Wells
P-526	948	J-528	J-525	12	130.0	28.8	0.08	0.004	Desert Wells
P-528	876	J-529	J-528	12	130.0	54.3	0.15	0.011	Desert Wells
P-529	896	J-529	J-501	12	130.0	76.6	0.22	0.022	Desert Wells
P-531	981	J-531	J-529	12	130.0	3.1	0.01	0.000	Desert Wells
P-533	802	J-531	J-508	8	130.0	38.0	0.24	0.043	Desert Wells
P-535	868	J-531	J-534	12	130.0	34.9	0.10	0.005	Desert Wells
P-537	970	J-534	J-535	12	130.0	20.8	0.06	0.002	Desert Wells
P-538	793	J-535	J-511	8	130.0	23.9	0.15	0.018	Desert Wells
P-540	828	J-535	J-538	12	130.0	21.4	0.06	0.002	Desert Wells
P-542	979	J-538	J-539	12	130.0	5.8	0.02	0.000	Desert Wells
P-543	485	J-539	J-521	12	130.0	20.7	0.06	0.002	Desert Wells
P-544	803	J-539	J-514	8	130.0	14.9	0.10	0.008	Desert Wells
P-902	157	R-2	PMP-2	48	130.0	275.8	0.05	0.000	Desert Wells
P-903	181	PMP-2	J-506	48	130.0	275.8	0.05	0.000	Desert Wells

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gal/min)	Pump Head (ft)
PMP-2	1,402.00	1,402.10	1,618.81	275.8	216.71

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gal/min)	Hydraulic Grade (ft)
R-2	1,402.10	275.8	1,402.10

MAXIMUM DAY DEMAND

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-500	1,389.72	0.0	1,618.44	99.0	Desert Wells
J-501	1,390.43	0.0	1,618.44	98.6	Desert Wells
J-502	1,396.95	0.0	1,618.50	95.9	Desert Wells
J-503	1,402.43	0.0	1,618.56	93.5	Desert Wells
J-504	1,404.09	0.0	1,618.56	92.8	Desert Wells
J-506	1,404.67	0.0	1,618.61	92.6	Desert Wells
J-507	1,403.04	28.8	1,618.52	93.2	Desert Wells
J-508	1,404.11	0.0	1,618.48	92.7	Desert Wells
J-509	1,401.57	37.2	1,618.45	93.8	Desert Wells
J-510	1,398.94	26.3	1,618.42	95.0	Desert Wells
J-511	1,397.71	0.0	1,618.40	95.5	Desert Wells
J-512	1,395.85	27.7	1,618.39	96.3	Desert Wells
J-513	1,392.07	27.7	1,618.38	97.9	Desert Wells
J-514	1,393.02	0.0	1,618.37	97.5	Desert Wells
J-515	1,392.18	38.3	1,618.37	97.9	Desert Wells
J-516	1,392.06	0.0	1,618.37	97.9	Desert Wells
J-518	1,384.62	0.0	1,618.35	101.1	Desert Wells
J-519	1,378.36	28.5	1,618.35	103.8	Desert Wells
J-521	1,385.93	0.0	1,618.35	100.6	Desert Wells
J-522	1,385.37	28.5	1,618.34	100.8	Desert Wells
J-524	1,388.26	59.7	1,618.34	99.5	Desert Wells
J-525	1,389.91	21.9	1,618.34	98.8	Desert Wells
J-528	1,390.26	51.0	1,618.35	98.7	Desert Wells
J-529	1,394.10	50.6	1,618.38	97.0	Desert Wells
J-531	1,394.22	0.0	1,618.38	97.0	Desert Wells
J-534	1,395.93	28.3	1,618.37	96.2	Desert Wells
J-535	1,393.88	27.1	1,618.36	97.1	Desert Wells
J-538	1,393.47	31.2	1,618.36	97.3	Desert Wells
J-539	1,389.86	0.0	1,618.35	98.9	Desert Wells

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-500	291	J-500	J-501	12	130.0	0.0	0.00	0.000	Desert Wells
P-501	954	J-501	J-502	12	130.0	140.8	0.40	0.067	Desert Wells
P-502	837	J-502	J-503	12	130.0	140.8	0.40	0.067	Desert Wells
P-504	63	J-504	J-503	16	130.0	140.8	0.22	0.015	Desert Wells
P-505	271	J-504	J-506	16	130.0	512.9	0.82	0.182	Desert Wells
P-506	419	J-504	J-507	16	130.0	372.1	0.59	0.100	Desert Wells
P-507	408	J-507	J-508	16	130.0	343.3	0.55	0.086	Desert Wells
P-508	539	J-508	J-509	16	130.0	274.2	0.44	0.057	Desert Wells
P-509	713	J-509	J-510	16	130.0	237.0	0.38	0.043	Desert Wells
P-510	584	J-510	J-511	16	130.0	210.8	0.34	0.035	Desert Wells
P-511	542	J-511	J-512	16	130.0	169.9	0.27	0.023	Desert Wells
P-512	787	J-512	J-513	16	130.0	142.2	0.23	0.017	Desert Wells
P-513	482	J-513	J-514	16	130.0	114.5	0.18	0.011	Desert Wells
P-514	405	J-514	J-515	16	130.0	89.4	0.14	0.007	Desert Wells
P-515	400	J-515	J-516	16	130.0	51.1	0.08	0.002	Desert Wells
P-516	1,299	J-516	J-518	12	130.0	51.1	0.14	0.010	Desert Wells
P-518	1,432	J-518	J-519	12	130.0	28.5	0.08	0.003	Desert Wells
P-519	804	J-521	J-518	12	130.0	22.6	0.06	0.002	Desert Wells
P-521	502	J-522	J-521	12	130.0	63.2	0.18	0.015	Desert Wells
P-523	961	J-524	J-522	12	130.0	34.7	0.10	0.005	Desert Wells
P-525	851	J-525	J-524	12	130.0	25.0	0.07	0.003	Desert Wells
P-526	948	J-528	J-525	12	130.0	46.9	0.13	0.009	Desert Wells
P-528	876	J-529	J-528	12	130.0	97.9	0.28	0.034	Desert Wells
P-529	896	J-529	J-501	12	130.0	140.8	0.40	0.067	Desert Wells
P-531	981	J-531	J-529	12	130.0	7.8	0.02	0.000	Desert Wells
P-533	802	J-531	J-508	8	130.0	69.1	0.44	0.130	Desert Wells
P-535	868	J-531	J-534	12	130.0	61.3	0.17	0.014	Desert Wells
P-537	970	J-534	J-535	12	130.0	33.0	0.09	0.005	Desert Wells
P-538	793	J-535	J-511	8	130.0	40.9	0.26	0.049	Desert Wells
P-540	828	J-535	J-538	12	130.0	46.8	0.13	0.009	Desert Wells
P-542	979	J-538	J-539	12	130.0	15.5	0.04	0.001	Desert Wells
P-543	485	J-539	J-521	12	130.0	40.6	0.12	0.007	Desert Wells
P-544	803	J-539	J-514	8	130.0	25.0	0.16	0.020	Desert Wells
P-902	157	R-2	PMP-2	48	130.0	512.9	0.09	0.000	Desert Wells
P-903	181	PMP-2	J-506	48	130.0	512.9	0.09	0.000	Desert Wells

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gal/min)	Pump Head (ft)
PMP-2	1,402.00	1,402.10	1,618.61	512.9	216.51

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gal/min)	Hydraulic Grade (ft)
R-2	1,402.10	512.9	1,402.10

PEAK HOUR DEMAND

Label	Elevation (ft)	Demand (gal/min)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-500	1,389.72	0.0	1,617.97	98.8	Desert Wells
J-501	1,390.43	0.0	1,617.97	98.4	Desert Wells
J-502	1,396.95	0.0	1,618.10	95.7	Desert Wells
J-503	1,402.43	0.0	1,618.21	93.4	Desert Wells
J-504	1,404.09	0.0	1,618.21	92.6	Desert Wells
J-506	1,404.67	0.0	1,618.31	92.4	Desert Wells
J-507	1,403.04	43.1	1,618.13	93.1	Desert Wells
J-508	1,404.11	0.0	1,618.06	92.6	Desert Wells
J-509	1,401.57	55.8	1,618.00	93.6	Desert Wells
J-510	1,398.94	39.4	1,617.93	94.7	Desert Wells
J-511	1,397.71	0.0	1,617.89	95.3	Desert Wells
J-512	1,395.85	41.6	1,617.87	96.1	Desert Wells
J-513	1,392.07	41.6	1,617.84	97.7	Desert Wells
J-514	1,393.02	0.0	1,617.83	97.3	Desert Wells
J-515	1,392.18	57.5	1,617.82	97.6	Desert Wells
J-516	1,392.06	0.0	1,617.82	97.7	Desert Wells
J-518	1,384.62	0.0	1,617.80	100.9	Desert Wells
J-519	1,378.36	42.7	1,617.79	103.6	Desert Wells
J-521	1,385.93	0.0	1,617.79	100.3	Desert Wells
J-522	1,385.37	42.7	1,617.78	100.6	Desert Wells
J-524	1,388.26	89.6	1,617.77	99.3	Desert Wells
J-525	1,389.91	23.2	1,617.78	98.6	Desert Wells
J-528	1,390.26	76.6	1,617.79	98.4	Desert Wells
J-529	1,394.10	75.9	1,617.85	96.8	Desert Wells
J-531	1,394.22	0.0	1,617.85	96.8	Desert Wells
J-534	1,395.93	42.4	1,617.83	96.0	Desert Wells
J-535	1,393.88	31.0	1,617.82	96.9	Desert Wells
J-538	1,393.47	46.9	1,617.80	97.1	Desert Wells
J-539	1,389.86	0.0	1,617.80	98.6	Desert Wells

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gal/min)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Zone
P-500	291	J-500	J-501	12	130.0	0.0	0.00	0.000	Desert Wells
P-501	954	J-501	J-502	12	130.0	204.9	0.58	0.135	Desert Wells
P-502	837	J-502	J-503	12	130.0	204.9	0.58	0.135	Desert Wells
P-504	63	J-504	J-503	16	130.0	204.9	0.33	0.033	Desert Wells
P-505	271	J-504	J-506	16	130.0	749.9	1.20	0.366	Desert Wells
P-506	419	J-504	J-507	16	130.0	545.0	0.87	0.203	Desert Wells
P-507	408	J-507	J-508	16	130.0	501.8	0.80	0.174	Desert Wells
P-508	539	J-508	J-509	16	130.0	401.6	0.64	0.115	Desert Wells
P-509	713	J-509	J-510	16	130.0	345.8	0.55	0.087	Desert Wells
P-510	584	J-510	J-511	16	130.0	306.4	0.49	0.070	Desert Wells
P-511	542	J-511	J-512	16	130.0	248.5	0.40	0.047	Desert Wells
P-512	787	J-512	J-513	16	130.0	207.0	0.33	0.034	Desert Wells
P-513	482	J-513	J-514	16	130.0	165.4	0.26	0.022	Desert Wells
P-514	405	J-514	J-515	16	130.0	130.3	0.21	0.014	Desert Wells
P-515	400	J-515	J-516	16	130.0	72.8	0.12	0.005	Desert Wells
P-516	1,299	J-516	J-518	12	130.0	72.8	0.21	0.020	Desert Wells
P-518	1,432	J-518	J-519	12	130.0	42.7	0.12	0.007	Desert Wells
P-519	804	J-521	J-518	12	130.0	30.1	0.09	0.004	Desert Wells
P-521	502	J-522	J-521	12	130.0	90.5	0.26	0.030	Desert Wells
P-523	961	J-524	J-522	12	130.0	47.8	0.14	0.009	Desert Wells
P-525	851	J-525	J-524	12	130.0	41.8	0.12	0.007	Desert Wells
P-526	948	J-528	J-525	12	130.0	65.0	0.18	0.016	Desert Wells
P-528	876	J-529	J-528	12	130.0	141.5	0.40	0.068	Desert Wells
P-529	896	J-529	J-501	12	130.0	204.9	0.58	0.135	Desert Wells
P-531	981	J-531	J-529	12	130.0	12.6	0.04	0.001	Desert Wells
P-533	802	J-531	J-508	8	130.0	100.2	0.64	0.258	Desert Wells
P-535	868	J-531	J-534	12	130.0	87.7	0.25	0.028	Desert Wells
P-537	970	J-534	J-535	12	130.0	45.2	0.13	0.008	Desert Wells
P-538	793	J-535	J-511	8	130.0	57.8	0.37	0.093	Desert Wells
P-540	828	J-535	J-538	12	130.0	72.1	0.20	0.019	Desert Wells
P-542	979	J-538	J-539	12	130.0	25.2	0.07	0.003	Desert Wells
P-543	485	J-539	J-521	12	130.0	60.4	0.17	0.014	Desert Wells
P-544	803	J-539	J-514	8	130.0	35.2	0.22	0.037	Desert Wells
P-902	157	R-2	PMP-2	48	130.0	749.9	0.13	0.000	Desert Wells
P-903	181	PMP-2	J-506	48	130.0	749.9	0.13	0.000	Desert Wells

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gal/min)	Pump Head (ft)
PMP-2	1,402.00	1,402.10	1,618.31	749.9	216.21

Label	Elevation (ft)	Flow (Out net) (gal/min)	Hydraulic Grade (ft)
R-2	1,402.10	749.9	1,402.10

MAXIMUM DAY DEMAND PLUS FIRE FLOW

RESIDUAL PRESSURE ANALYSIS

AVAILABLE FIRE FLOW ANALYSIS

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-500	0.0	3,000.0	3,000.0	3,001.0	3,001.0	86.3	87.1	J-508	P-500	8.51	True
J-501	0.0	3,000.0	3,000.0	3,001.0	3,001.0	88.4	87.1	J-508	P-505	5.61	True
J-502	0.0	3,000.0	3,000.0	3,001.0	3,001.0	87.1	87.3	J-508	P-502	5.98	True
J-503	0.0	3,000.0	3,000.0	3,001.0	3,001.0	88.3	87.7	J-508	P-505	5.61	True
J-504	0.0	3,000.0	3,000.0	3,001.0	3,001.0	87.7	87.7	J-508	P-505	5.61	True
J-506	0.0	3,000.0	3,000.0	3,001.0	3,001.0	88.2	88.4	J-508	P-56	1.87	True
J-507	28.8	3,000.0	3,028.8	3,001.0	3,029.8	87.3	86.8	J-508	P-505	5.61	True
J-508	0.0	3,000.0	3,000.0	3,001.0	3,001.0	86.2	87.3	J-509	P-505	5.61	True
J-509	37.2	3,000.0	3,037.2	3,001.0	3,038.2	86.5	86.2	J-508	P-505	5.61	True
J-510	26.3	3,000.0	3,026.2	3,001.0	3,027.2	86.8	86.3	J-508	P-505	5.61	True
J-511	0.0	3,000.0	3,000.0	3,001.0	3,001.0	86.9	86.4	J-508	P-505	5.61	True
J-512	27.7	3,000.0	3,027.7	3,001.0	3,028.7	87.1	86.4	J-508	P-505	5.61	True
J-513	27.7	3,000.0	3,027.7	3,001.0	3,028.7	88.1	86.4	J-508	P-505	5.61	True
J-514	0.0	3,000.0	3,000.0	3,001.0	3,001.0	87.4	86.4	J-508	P-505	5.61	True
J-515	38.3	3,000.0	3,038.3	3,001.0	3,039.3	87.3	86.4	J-508	P-505	5.61	True
J-516	0.0	3,000.0	3,000.0	3,001.0	3,001.0	87.0	86.4	J-508	P-505	5.61	True
J-518	0.0	3,000.0	3,000.0	3,001.0	3,001.0	88.7	86.5	J-508	P-505	5.61	True
J-519	28.5	3,000.0	3,028.5	3,001.0	3,029.5	79.2	86.5	J-508	P-518	8.59	True
J-521	0.0	3,000.0	3,000.0	3,001.0	3,001.0	89.4	86.5	J-508	P-505	5.61	True
J-522	28.5	3,000.0	3,028.5	3,001.0	3,029.5	88.1	86.6	J-508	P-521	5.80	True
J-524	59.7	3,000.0	3,059.7	3,001.0	3,060.7	85.4	86.4	J-525	P-505	5.61	True
J-525	21.9	3,000.0	3,021.9	3,001.0	3,022.9	84.7	86.7	J-508	P-505	5.61	True
J-528	51.0	3,000.0	3,051.0	3,001.0	3,052.0	85.8	86.7	J-508	P-528	5.72	True
J-529	50.6	3,000.0	3,050.6	3,001.0	3,051.6	86.9	86.8	J-508	P-505	5.61	True
J-531	0.0	3,000.0	3,000.0	3,001.0	3,001.0	86.5	86.5	J-534	P-505	5.61	True
J-534	28.3	3,000.0	3,028.3	3,001.0	3,029.3	84.4	86.6	J-508	P-505	5.61	True
J-535	27.1	3,000.0	3,027.1	3,001.0	3,028.1	85.7	86.2	J-534	P-505	5.61	True
J-538	31.2	3,000.0	3,031.2	3,001.0	3,032.3	85.1	86.5	J-508	P-505	5.61	True
J-539	0.0	3,000.0	3,000.0	3,001.0	3,001.0	87.6	86.5	J-508	P-505	5.61	True

Label	Demand (gal/min)	Fire Flow (Needed) (gal/min)	Flow (Total Needed) (gal/min)	Fire Flow (Available) (gal/min)	Flow (Total Available) (gal/min)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Satisfies Fire Flow Constraints?
J-500	0.0	3,000.0	3,000.0	3,525.1	3,525.1	86.3	87.1	J-508	P-500	10.00	True
J-501	0.0	3,000.0	3,000.0	5,754.0	5,754.0	88.4	87.1	J-508	P-505	10.00	True
J-502	0.0	3,000.0	3,000.0	5,112.4	5,112.4	87.1	87.3	J-508	P-502	10.00	True
J-503	0.0	3,000.0	3,000.0	5,754.0	5,754.0	88.3	87.7	J-508	P-505	10.00	True
J-504	0.0	3,000.0	3,000.0	5,754.0	5,754.0	87.7	87.7	J-508	P-505	10.00	True
J-506	0.0	3,000.0	3,000.0	10,000.0	10,000.0	88.2	88.4	J-508	P-56	1.87	True
J-507	28.8	3,000.0	3,028.8	5,754.0	5,782.8	87.3	86.8	J-508	P-505	10.00	True
J-508	0.0	3,000.0	3,000.0	5,754.0	5,754.0	86.2	87.3	J-509	P-505	10.00	True
J-509	37.2	3,000.0	3,037.2	5,754.0	5,791.2	86.5	86.2	J-508	P-505	10.00	True
J-510	26.3	3,000.0	3,026.2	5,754.0	5,780.3	86.8	86.3	J-508	P-505	10.00	True
J-511	0.0	3,000.0	3,000.0	5,754.0	5,754.0	86.9	86.4	J-508	P-505	10.00	True
J-512	27.7	3,000.0	3,027.7	5,754.0	5,781.7	87.1	86.4	J-508	P-505	10.00	True
J-513	27.7	3,000.0	3,027.7	5,754.0	5,781.7	88.1	86.4	J-508	P-505	10.00	True
J-514	0.0	3,000.0	3,000.0	5,754.0	5,754.0	87.4	86.4	J-508	P-505	10.00	True
J-515	38.3	3,000.0	3,038.3	5,754.0	5,792.3	87.3	86.4	J-508	P-505	10.00	True
J-516	0.0	3,000.0	3,000.0	5,754.0	5,754.0	87.0	86.4	J-508	P-505	10.00	True
J-518	0.0	3,000.0	3,000.0	5,754.0	5,754.0	88.7	86.5	J-508	P-505	10.00	True
J-519	28.5	3,000.0	3,028.5	3,496.6	3,525.1	79.2	86.5	J-508	P-518	10.00	True
J-521	0.0	3,000.0	3,000.0	5,754.0	5,754.0	89.4	86.5	J-508	P-505	10.00	True
J-522	28.5	3,000.0	3,028.5	5,236.6	5,265.1	88.1	86.6	J-508	P-521	10.00	True
J-524	59.7	3,000.0	3,059.7	5,754.0	5,813.7	85.4	86.4	J-525	P-505	10.00	True
J-525	21.9	3,000.0	3,021.9	5,754.0	5,775.9	84.7	86.7	J-508	P-505	10.00	True
J-528	51.0	3,000.0	3,051.0	5,335.0	5,386.1	85.8	86.7	J-508	P-528	10.00	True
J-529	50.6	3,000.0	3,050.6	5,754.0	5,804.6	86.9	86.8	J-508	P-505	10.00	True
J-531	0.0	3,000.0	3,000.0	5,754.0	5,754.0	86.5	86.5	J-534	P-505	10.00	True
J-534	28.3	3,000.0	3,028.3	5,754.0	5,782.3	84.4	86.6	J-508	P-505	10.00	True
J-535	27.1	3,000.0	3,027.1	5,754.0	5,781.1	85.7	86.2	J-534	P-505	10.00	True
J-538	31.2	3,000.0	3,031.2	5,754.0	5,785.2	85.1	86.5	J-508	P-505	10.00	True
J-539	0.0	3,000.0	3,000.0	5,754.0	5,754.0	87.6	86.5	J-508	P-505	10.00	True