SUNRISE
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TOWN OF MINDEN
WATER SYSTEM ANALYSIS

Minden, Nevada
June 2017

TOWN OF MINDEN, NEVADA

WATER SYSTEM ANALYSIS

JUNE 2017

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Minden NEVADA
Established 1906

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1 PROJECT BACKGROUND

1.1 Purpose & Need

The Town of Minden (Town) has entered into an agreement with Sunrise Engineering, Inc. (Sunrise) to prepare a Water System Analysis. This analysis was commissioned for the purpose of serving the Town as a guidance document with important information relative to current and future system conditions. The need for the analysis is based on the value of an objective review of the system and its ability to serve existing and future demands. The Town desires to know the state of the system as it is now (existing capacity), and how much additional growth can be allowed while still meeting the State requirements and providing an adequate level of service to the existing customers.

1.2 Scope of Work

The Town operates on the premise that it seeks to sustainably provide water in sufficient quantity and quality to residents and enterprises within its service area in the near term and through build-out. This objective is supported by occasional short-term and long-term planning efforts as the need arises. Given the purpose and need described above, the following were key elements contemplated in the scope of work for this project:

- Conduct site visits and progress meetings as necessary to define the system.
- Review and incorporate existing reports and data in the analyses.
- Prepare a System User Analysis to project future demands on the system.
- Evaluate the system at the following time intervals:
    - Existing
    - 5-Year
    - 20-Year
    - Vested connections
- Prepare base maps and background information as required.
- Complete a five-point analysis for the system:
    - Water Rights (summary of previous report)
    - Source Capacity
    - Storage Capacity
    - Treatment
    - Distribution System
- Combine, refine, and operate the Town's hydraulic network model.
- Prepare a written report with recommended improvements.
- Report to the Town's Staff and Town's Board regularly during the course of the project.
- Provide updated network hydraulic model to the Town at the conclusion of the project.

1.3 Geography/Climate

The Town of Minden is located in northern Douglas County approximately 15 miles south of Carson City, Nevada and just east of Lake Tahoe. Minden is located in the Carson Valley with the

surrounding towns of Gardnerville and Genoa. The Town experiences average highs in the high 40's during the winter and low 90's during the summer.

1.4 Governing Codes

During the course of the water system analysis effort, the Town's water system was analyzed against current applicable codes, primarily the Nevada Administrative Code (NAC) 445A Water Controls.

1.5 Planning Horizons

At the direction of the Town, this analysis considers three planning horizons. This analysis will consider a 5-year planning horizon to evaluate immediate deficiencies and accompanying recommended improvements. This analysis will also consider a 20-year planning horizon to evaluate potential deficiencies in the long term and be able to plan for the improvements necessary to resolve any deficiencies. Finally, this analysis will evaluate the system based on the number of vested connections, or the number of connections the Town currently has obligation to serve.

1.6 Miscellaneous Resources

In addition to the resources previously cited, the Town provided all pertinent available data in its possession. The data provided is summarized below:

- Town of Minden Water Conservation Plan (April 6, 2016)
- Water use spreadsheet used for April 2016 Water Conservation Plan
- Town of Minden Retail Water System Capacity Charges and Rate Study (February 2016)
- Town of Minden Wholesale Water System Rates and Financial Plan
- North Douglas County Water System Analysis (July 2009)
- Chapter 1 of WBA Draft October 2016
- Town of Minden Well Information document
- Customer Services spreadsheets
- 2013-2014 Meter Consumption spreadsheet
- 2014-2016 Monthly Flow Reports (Wells, Buckeye Booster, Buckeye Tank, Heybourne)
- 2013-2016 Monthly Pumping Totals
- Water System Mapping
    - 2011-11-21 Town of Minden System Mapping – Well Locations
    - 2015-8-25 System Mapping Overall (CAD file)

    - 2016-1-8 Town of Minden Water Service Area
    - 2016-06-07 Town of Minden System Mapping
    - 2013-10-31 Town of Minden System Mapping
    - April 2014 Town of Minden System Mapping – Well Locations
- Site Plan for Town of Minden Buckeye Booster Station Upgrades
- Actual upstream and downstream pressures of pressure reducing valves in Buckeye Booster Station
- Well information:
    - Well #2 - pump curve, pumping data, well log
    - Well #3 - pump curve, well log
    - Well #4 - pump curve, well log
    - Well #5 - well log
    - Well #7 - pump curve
    - Well #8 - pump curve, well log
    - Well #9 - pump curve, well log, record drawings
    - Well #10 - pump curve, well log, record drawings, well detail
    - Well #11 - pump curve, well log, pumping data, 50% Plans
- Tank Plan showing tank diameter
- Existing water models
- Heybourne Pump Station Disinfection System Alternative Design Modification - Memo
- Town of Minden 10 year CIP
- Vested Properties Log spreadsheet
- Possible Growth documents
- Wholesale Interlocal Agreement
- Wholesale Usage Agreement
- Wholesale Usage Report
- Consumer Confidence Reports (2009-2016)

In addition, Sunrise and Town representatives met in multiple plan development meetings in which information, concepts, constraints, etc. were discussed; to the maximum extent possible, those discussions are captured in the analyses and recommendations represented in this report.

2 SYSTEM USERS ANALYSIS

2.1 Existing Conditions

The Town of Minden, Nevada is identified as Water System No. NV0000168 by the Nevada Division of Environmental Protection. The retail system is classified as a community water system with approximately 1,600 total connections and serving a population of nearly 3,500 residents according to data provided by the State. Based on data provided by the Town, in the year 2015, there were approximately 1,602 metered connections in the system.

2.2 Projected Growth Rate

An important element in a water system analysis is projecting a growth rate within the service area. This projection gives the planner an idea of the future demands that may be required of the utility system and the required capital improvements for the service area.

Table 2-1 below shows the official U.S. Census and Nevada state demographer estimates for Minden and provides an idea of how the community has changed from the years 2000 through 2014. The annual data, which is summarized here, shows a relatively steady growth rate from 2000 to 2014. The average annual growth from 2000-2010 is 0.57%, and from 2010-2014 is 0.59%.

Table 2-1: Minden Growth History

Minden:	Population	Annual Growth
2000 Census Population	2,836	
2010 Census Population	3,001	0.57%
2011 Estimated Population	2,984	-0.57%
2012 Estimated Population	3,010	0.87%
2013 Estimated Population	2,993	-0.56%
2014 Estimated Population	3,072	2.64%

Also helpful in projecting the growth rate is estimates and projections for the County and the State. Table 2-2 shows growth estimates and projections based on U.S. Census estimates and the Nevada state demographer.

Table 2-2: Douglas County and State of Nevada Growth History and Projections

Source	Area	Timeframe	Growth Rate
U.S. Census Bureau	Douglas County	2010-2015	0.30%
Nevada State Demographer	Douglas County	2010-2015	0.52%
Nevada State Demographer	Douglas County	2015-2020 (Projected)	0.29%
Nevada State Demographer	Nevada	2015-2020 (Projected)	1.09%

Projecting the number of connections through the planning period can be a subjective process, and various entities have differing opinions as to the rate of growth that can be projected. Based on the historical growth rates and projections for the Town of Minden, Douglas County, and the State of Nevada, and in consultation with the Town's staff, **a growth rate of 1.0% has been assumed for this report**. Although this value is slightly higher than the estimated historical

growth for the Town of Minden, it is still a relatively mild growth rate that could easily be surpassed if trends change over the next decade or two.

It is important to understand that projected population figures are not the cornerstone of this analysis. If the maximum number of system connections projected is reached earlier or later than projected, future improvements to support growth may either come earlier or later.

Once the growth rate has been established, the population can be projected forward. The associated population projection is shown in Figure 2-2 later in the report.

2.3 Water Use & ERUs

The Town has provided retail and wholesale usage data for the years 2013 through 2015. Data from 2016 is still being compiled and therefore not used in this report. The retail and wholesale use per month for the years where data has been provided is shown in Table 2-3 and Table 2-4 respectively. This report will mainly focus on retail use because the analysis includes the connections in the Town's service area. However, wholesale use is also considered in order to show how the wholesale use affects the Town's capacity to serve additional connections.

Table 2-3. Retail Usage (1,000 Gallons)

	2013	2014	2015
January	9,213	10,929	14,266
February	11,800	18,255	15,343
March	25,641	12,256	7,895
April	44,066	59,770	72,585
May	65,970	71,413	50,090
June	95,868	54,970	56,811
July	87,003	84,161	60,509
August	81,105	99,894	70,035
September	81,531	24,733	54,390
October	16,283	49,276	26,844
November	16,131	8,862	11,998
December	9,951	12,266	11,572
Total	**544,562**	**506,785**	**452,338**

Table 2-4. Wholesale Usage (1,000 Gallons)

	2013	2014	2015
January	22,787	23,974	41,656
February	16,454	35,590	35,807
March	21,125	75,219	78,397
April	64,522	154,327	106,264
May	72,025	223,392	123,677
June	83,302	242,812	164,243
July	104,488	240,088	228,557
August	104,391	196,406	246,667
September	80,309	218,503	237,304
October	59,662	149,236	197,382
November	15,683	89,063	58,921
December	20,103	48,601	23,907
Total	**664,851**	**1,697,211**	**1,542,782**

In addition to the retail use and wholesale use above is "other" use, where other use is taken as town use. Because town use was not metered during this timeframe, it has been estimated as 20,000,000 gallons per year. This is based on the assumption of 1,000,000 gallons per month of flushing and 1,000,000 gallons per month of general town use during the months of April through October.

The retail use is broken down into residential usage and commercial usage. This usage breakown will be used to calculate the number of equivalent residential units (ERU) in the system. An ERU represents the additional volume of water required for commercial users above and beyond the amount used by an average residential connection. The ERU value is determined by comparing

the average daily use per commercial connection to the average daily use per residential connection. For example, if a commercial connection uses three times as much water on average as the average residential connection, the commercial connection would be counted as 3 ERUs.

The Nevada Administrative Code (NAC) defines a Residential Equivalent as "the average daily demand for water that is typical of a private residence served by a single service connection." This value is essentially a standard by which the water use of all other connection types is compared, and is often referred to as an Equivalent Residential Unit (ERU) or an Equivalent Residential Connection (ERC).

Analysis of the 2013, 2014, and 2015 usage data provided by the Town is summarized in Table 2-5 on the following page and tabulates the total use per year for each type of connection (residential, commercial, and other), number of connections for each category, usage per connection, usage per ERU, and number of ERUs. and relative use as compared against the ERU standard. Table 2-5 suggests that, in the year 2015, there were 2,203 active ERUs on the Town's water system.

The number of ERUs presented in Table 2-5 were calculated as follows:

- Residential ERUs are equal to the number of residential connections by definition.
- Commercial ERUs are calculated by comparing the commercial usage per connection to residential usage per connection. For example, the average commercial usage per connection for the three years divided by the average residential usage per connection for the three years, yields 3.24 ERUs per average commercial connection:

  $$2{,}126\ \frac{gal}{day} \Big/ 656\ \frac{gal}{day} = 3.24\ \frac{ERUs}{Commercial\ Conn.}$$

  The value of 3.24 will be used for this report as the ERUs per commercial connection. This value is multiplied by the number of commercial connections to calculate the total number of commercial ERUs. For example, in the year 2015, the total number of commercial ERUs is calculated as 748.

  $$231\ Conn. x\ 3.24\ \frac{ERUs}{Commercial\ Conn.} = 748\ Commercial\ ERUs$$

- Other ERUs are calculated by taking the total "other" usage and dividing it by the 365 days to convert to an average daily usage, and then dividing it be the average residential usage per connection. For the year 2015, the result is 84 other ERUs.

  $$\frac{20{,}000{,}000\ gallons}{365\ days} \Big/ 656\ \frac{gal}{day} = 84\ Other\ ERUs$$

It is important to note that, even though commercial connections account for less than 15% of the total connections, they account for approximately 35% of the total usage and similarly approximately 35% of the total number of ERUs.

Table 2-5. Determining Current Number of ERUs

	2013	2014	2015	2013 to 2015 Avg
Residential Usage (gallons)	357,116,787	328,341,219	280,538,847	321,998,951
Commercial Usage (gallons)	187,445,213	178,443,781	171,799,153	179,229,382
Other Usage (gal/year)	20,000,000	20,000,000	20,000,000	20,000,000
Residential Connections	1,323	1,348	1,371	1,347
Commercial Connections	233	229	231	231
Total Connections	1,556	1,577	1,602	1,578
Residential Usage Per Connection (gal/day)	740	667	561	656
Commercial Usage Per Connection (gal/day)	2,204	2,135	2,038	2,126
Residential ERUs	1,323	1,348	1,371	1,347
Commercial ERUs	755	742	748	748
Other ERU's	84	84	84	84
Total ERUs	**2,161**	**2,174**	**2,203**	**2,179**

2.4 Water Use by Season

Water use typically varies substantially depending on the time of the year. This is especially noticeable when there is not a separate irrigation system available to system users. The chart below shows the same information as in Table 2-3 for retail usage; however, it is easier to see the seasonal trends in the chart.

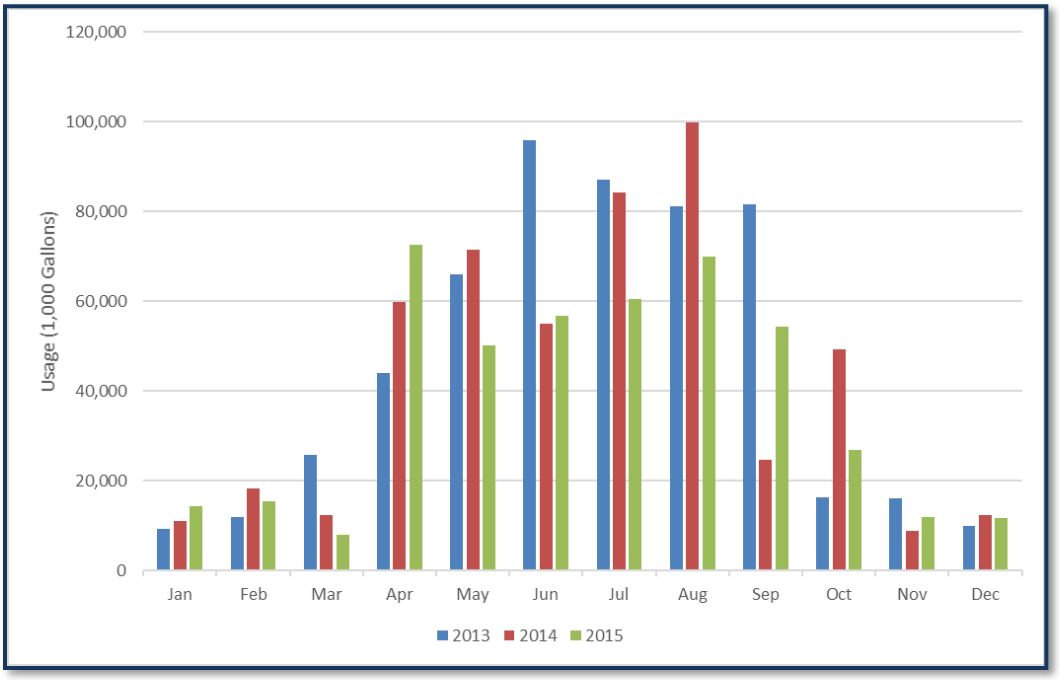


Figure 2-1: Monthly Retail Use

2.5 Estimated Indoor and Outdoor Usage

Indoor usage represents the amount of water a typical residential connection would use with no outside irrigation. The indoor usage can be approximated by looking at the usage during the "winter" months where it is assumed outside irrigation is negligible.

Figure 2-1 shows that the months of November through February are consistently low. These four months will be taken as the winter months. The average usage during these months will be assumed to be the indoor usage for the system. The average outdoor usage would therefore be calculated by subtracting the average indoor usage from the total average usage. It is important to note that the outdoor usage calculated is an average for the entire year, and the outdoor usage during the peak month will be higher than average.

- Average indoor usage – 192 gal/day per ERU
- Average outdoor usage – 464 gal/day per ERU

2.6 Potential Future ERUs

The total number of ERUs in the year 2015 based on each type of connection was calculated in Section 2.3. Applying the growth value of 1.0% that was used for this report, the number of ERUs throughout the planning period can be calculated. The past and future population and number of ERUs for the water system are shown in Figure 2-2 below.

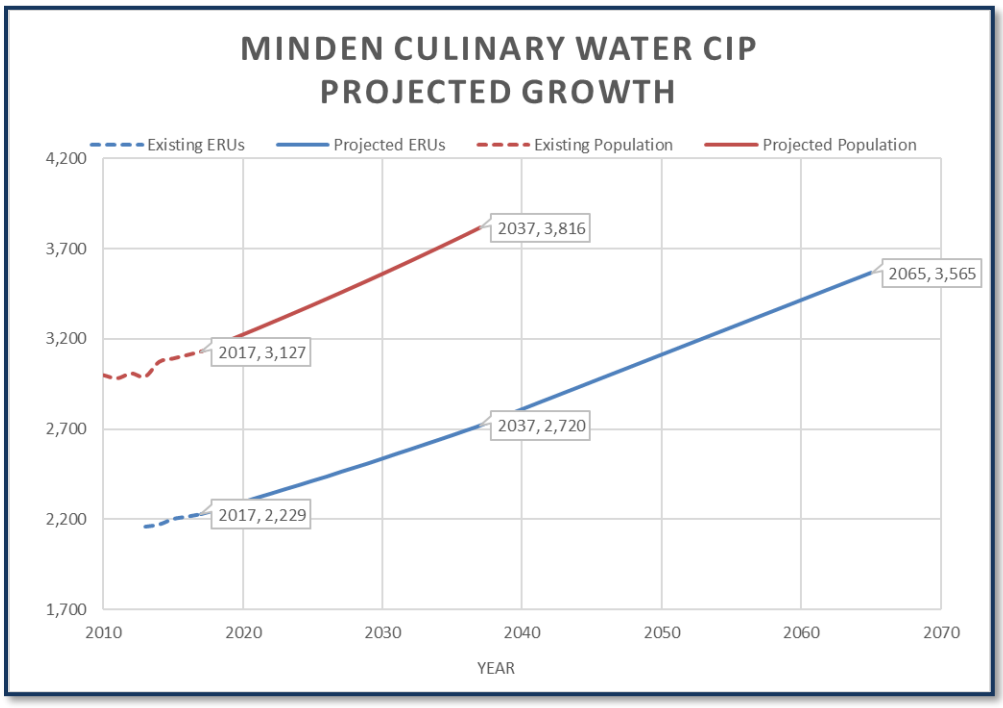


Figure 2-2: Minden Population & Connection Growth Projections

Table 2-6 below shows the projected number of ERUs and population for the town of Minden. The highlighted rows in the table correspond with the planning horizon years that will be used for evaluating the 5-point analysis.

Table 2-6: Future Estimated ERUs Summary

Year	Source	Est. Residential Growth Rate	Estimated Residential ERU's	Estimated Commercial ERU's	Other ERU's	Estimated ERU's	Estimated Population
2010	Census	-					3,001
2011	State Demographer	-0.57%					2,984
2012	State Demographer	0.87%					3,010
2013	State Demographer	-0.56%	1,323	755	84	2,162	2,993
2014	State Demographer	2.64%	1,348	742	84	2,174	3,072
2015	Estimate	0.59%	1,371	748	84	2,203	3,090
2016	Estimate	0.59%	1,379	753	84	2,216	3,109
2017	Estimate	0.59%	1,387	757	85	2,229	3,127
2018	Projection	1.0%	1,401	765	85	2,251	3,158
2019	Projection	1.0%	1,415	773	86	2,274	3,190
2020	Projection	1.0%	1,429	780	87	2,296	3,222
2021	Projection	1.0%	1,444	788	88	2,320	3,254
2022	Projection	1.0%	1,458	796	89	2,343	3,287
2023	Projection	1.0%	1,473	804	90	2,367	3,320
2024	Projection	1.0%	1,487	812	91	2,390	3,353
2025	Projection	1.0%	1,502	820	92	2,414	3,386
2026	Projection	1.0%	1,517	828	92	2,437	3,420
2027	Projection	1.0%	1,533	837	93	2,463	3,454
2028	Projection	1.0%	1,548	845	94	2,487	3,489
2029	Projection	1.0%	1,563	853	95	2,511	3,524
2030	Projection	1.0%	1,579	862	96	2,537	3,559
2031	Projection	1.0%	1,595	871	97	2,563	3,595
2032	Projection	1.0%	1,611	879	98	2,588	3,631
2033	Projection	1.0%	1,627	888	99	2,614	3,667
2034	Projection	1.0%	1,643	897	100	2,640	3,703
2035	Projection	1.0%	1,659	906	101	2,666	3,741
2036	Projection	1.0%	1,676	915	102	2,693	3,778
2037	Projection	1.0%	1,693	924	103	2,720	3,816
2065	Vested	1.0% Annually	2,213	1216	136	3,565	5,001

2.7 Average Demands & Peaking Factors

The review of water use in the Town's system as heretofore described yielded reliable and consistent data upon which analysis of the water system may be based. At a basic level, a residential connection, uses an average of 19,916 gallons per month, or specifically 656 gallons per day as was presented in Section 2.3. **For the purposes of this report, the average daily water use per ERU is established as 656 gallons per day**. This value will also be referred to as the average day demand per ERU. The average day demand for the entire system can be found by multiplying the average day demand per ERU by the number of ERUs in the system.

Under the rules of the Nevada Administrative Code (NAC) 445A.6672, three different flow scenarios must be modeled to demonstrate a distribution system's adequate capacity, as follows:

- At least 40 psi must be retained as residual pressure in the distribution system under **maximum day demand** conditions.
- At least 30 psi must be retained as residual pressure in the distribution system under **peak hour demand** conditions.
- At least 20 psi must be retained as residual pressure in the distribution system under **maximum day demand plus fire flow** conditions.

The terms included in the different scenarious are defined as follows:

- Per the Nevada Administrative Code (NAC) 445A.6611, maximum day demand is defined as "*the maximum daily demand for water over a yearly period, as determined by historical data.*"
- Per the Nevada Administrative Code (NAC) 445A.66185, peak hour demand is defined as "*the volume of water which must be supplied by a public water system to meet the demand of its customers for water during the hour that the maximum amount of water is used for a yearly period, as determined by historical data.*"
- Per the Nevada Administrative Code (NAC) 445A.6594, fire flow is defined as "*the rate of the flow of water, as determined by the fire authority and expressed in gallons per minute, which:*
    1. *Is required for protection from fire; and*
    2. *Can be delivered from a distribution system at a residual pressure of 20 psi at a fire hydrant.*"

Table 2-7 summarizes how the calculated maximum day and peak hour demand uses were determined for the purposes of this report. In order to estimate the maximum day demand and peak hour demand for the system, peaking factors are applied to known average day demand values. These peaking factors represent the ratio or multiplier between the demand in question and the average day demand. The peaking factors are ideally based on historical data; however, in the absence of historical data they are based on engineering judgment. Empirical studies have been completed in an attempt to set a typical range for the peaking factors. The peaking factor ranges indicated below come from the *Civil Engineering Reference Manual, 9th Edition*. Of note, the peaking factor ranges given are typical of the entire country, but are not specific to the arid western United States. The peaking factors for the Town of Minden are therefore expected to be greater than the range shown in Table 2-7.

Table 2-7: Peaking Factors & Peak Flows

Scenario	Avg Daily Demand (gpd/ERU)	Peaking Factor Range	Peaking Factor Used	**Demand (gpd/ERU)**
Average Day Demand	656	~	1.0	**656**
Maximum Day Demand	656	1.5 to 1.8	2.0	**1,314**
Peak Hour Demand	656	2.0 to 3.0	4.0	**2,623**

The peaking factor of 2.0 for maximum day demand was calculated based on the average monthly demand of the years 2013-2015. The value of 2.0 is the largest value of monthly average usage

divided by yearly average usage for retail use as can be seen in Figure 2-3. The value corresponds with the typical value that is used when no historical data is present.

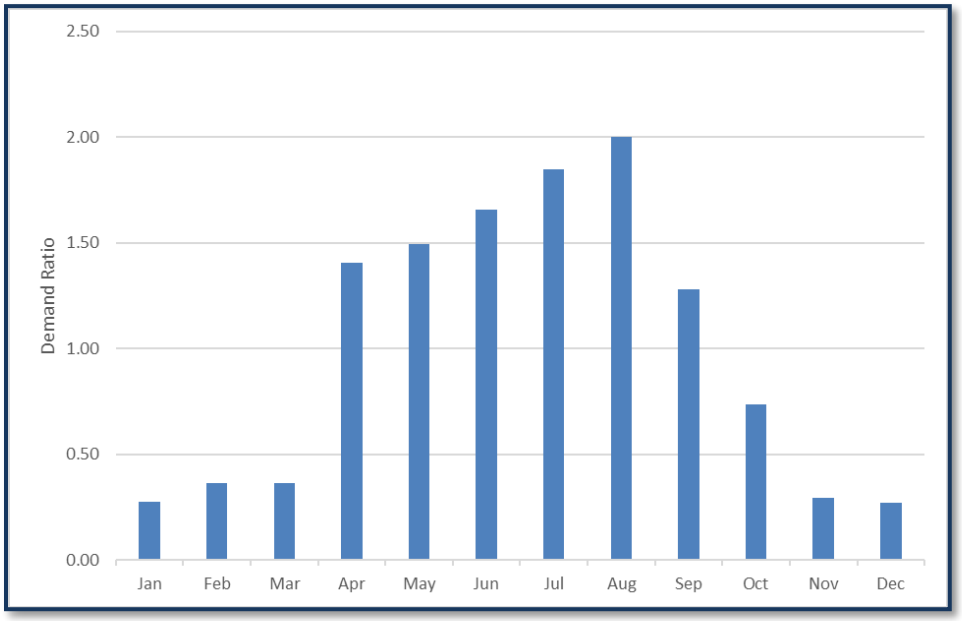


Figure 2-3. Monthly Avg. Demand / Yearly Avg. Demand

The peak hour demand of 4.0 is twice the maximum day demand factor and is based on engineering judgment.

2.8 Fire Flow Requirements

The Town of Minden has indicated using a fire flow of 1,500 gpm for this report. **Therefore, for the purposes of this report, the fire flow demand is established at 1,500 gpm.**

3 WATER RIGHTS ANALYSIS

The Town of Minden provided a worksheet that shows the water rights information for the wells owned by the Town. The worksheet shows the water permits for each well. The extent of this report will be to summarize the information shown in the worksheet and to compare it to existing and projected required water usage.

3.1 Water Rights Portfolio

Table 3-1 shows all active water rights that are held in the possession of the Town per the information provided by the Town.

Table 3-1: Water Rights – Town of Minden

Town of Minden Culinary Water Rights		Flow		Duty
App. No.	Point of Diversion	gpm	cfs	ac-ft
85979	Well #1	13.5	0.030	22.0
60636	Well #2	763.9	1.702	1,232.3
60637	Well #3	1,616.6	3.602	2,607.9
60638	Well #4	1,723.4	3.840	2,780.2
60639	Well #5	1,907.4	4.250	414.1
60640	Well #6	67.3	0.150	20.0
82284	Well #6	74.5	0.166	120.0
69593	Well #8	673.2	1.500	1,086.0
60635	Well #11	1,490.0	3.320	2,403.3
Total Town of Minden Water Rights		**8,329.8**	**18.560**	**10,685.7**

In addition to the water rights owned by the Town of Minden, additional water rights have points of diversion being wells operated by the Town of Minden. These water rights aid in providing wholesale water. The amount of water rights and the associated wells is provided in Table 3-2.

Table 3-2. Water Rights by Well (Ac-Ft)

Well #	Town of Minden	Carson City	Douglas County	Indian Hills GID	Combined
1	22.00	0	0	0	22.00
2	1,232.33	700.00	0	0	1,932.33
3	2,607.87	650.00	0	0	3,257.87
4	2,780.16	0	0	0	2,780.16
5	414.06	640.00	82.72	0	1,136.78
6	140.01	0	4.04	0	144.05
7	0	250.00	531.46	0	781.46
8	1,085.96	0	127.43	0	1,213.39
9	0	500.00	1,127.33	0	1,627.33
10	0	0	860.59	1,454.60	2,315.19
11	2,403.31	0	0	0	2,403.31
Total	**10,685.70**	**2,740.00**	**2,733.57**	**1,454.60**	**17,613.87**

3.2 Existing Required Water Right

Water rights are generally evaluated based on an "average day" demand basis. As mentioned previously, the average daily usage for residential connections was determined using the Town of Minden's historical usage data and determined to be 656 gallons per day as shown in Table 2-7.

The existing required water right was calculated by multiplying the average daily water use per ERU by the total number of ERUs in the system. The results of the analysis are presented in acre-feet annually and gallons per minute. When compared with the Town's total available water rights summarized in Table 3-1, it becomes apparent that the Town has sufficient rights under existing growth conditions.

In addition to the water rights required of the Town, additional water rights are required due to wholesale use. These water rights have been calculated based on the average wholesale use from available historical data. The required amount was converted to acre feet and compared with the water rights belonging to Carson City, Douglas County, and Indian Hills GID. Based on the data shown in Table 3-3 below, there exists adequate water right to provide the wholesale water under current conditions.

Table 3-3: Required Water Right (Existing Conditions)

Residential										
1,387	ERU's X	656	gpd X	1 day X	1 hr	=	632	gpm		
			ERU	24 hr	60 min.					
Commercial										
757	ERU's X	656	gpd X	1 day X	1 hr	=	345	gpm		
			ERU	24 hr	60 min.					
Other										
85	ERU's X	656	gpd X	1 day X	1 hr	=	39	gpm		
			ERU	24 hr	60 min.					
					Total Required Retail Water Right	=	**1,015**	**gpm**	**1,637.8**	**Acft**
					Existing Minden Water Right				**10,685.7**	**Acft**
					Total Retail Water Right Available				**9,047.9**	**Acft**
Wholesale (Average Usage)						=	**2,526**	**gpm**		
					Required Wholesale Water Right				**4,075.1**	**Acft**
					Existing Wholesale Water Right				**6,928.2**	**Acft**
					Total Water Right Available				**2,853.1**	**Acft**

3.3 Projected Required Water Right

Projecting growth to the 5-year planning horizon and using the same method of calculating water rights demand as for the required existing water rights reveals that the Town will have sufficient water rights in the 5-year planning horizon, as shown in Table 3-4.

The projections also show that existing wholesale water rights will be sufficient through the 5-year planning horizon as shown in Table 3-4. The projected wholesale usage was assumed to have a 1% growth similar to the projected growth in the Town of Minden.

Table 3-4: Required Water Right (5-Year Planning Horizon)

Residential										
1,458	ERU's X	656	gpd X	1 day X	1 hr	=	664	gpm		
			ERU	24 hr	60 min.					
Commercial										
796	ERU's X	656	gpd X	1 day X	1 hr	=	363	gpm		
			ERU	24 hr	60 min.					
Other										
89	ERU's X	656	gpd X	1 day X	1 hr	=	40	gpm		
			ERU	24 hr	60 min.					
					Total Required Retail Water Right	=	**1,067**	**gpm**	**1,721.3**	**Acft**
					Existing Minden Water Right				**10,685.7**	**Acft**
					Total Retail Water Right Available				**8,964.4**	**Acft**
Wholesale (Average Usage)						=	**2,655**	**gpm**		
					Required Wholesale Water Right				**4,282.9**	**Acft**
					Existing Wholesale Water Right				**6,928.2**	**Acft**
					Total Water Right Available				**2,645.2**	**Acft**

Similarly, projecting growth to the 20-year planning horizon and using the same method of calculating water rights demand reveals that the Town will have sufficient water rights in the 20-year planning horizon, as shown in Table 3-5.

The projections also show that existing wholesale water rights will be sufficient through the 20-year planning horizon as shown in Table 3-5. The projected wholesale usage was assumed to have a 1% growth similar to the projected growth in the Town of Minden.

Table 3-5: Required Water Right (20-Year Planning Horizon)

Residential										
1,693	ERU's X	656	gpd X	1 day X	1 hr	=	771	gpm		
			ERU	24 hr	60 min.					
Commercial										
924	ERU's X	656	gpd X	1 day X	1 hr	=	421	gpm		
			ERU	24 hr	60 min.					
Other										
103	ERU's X	656	gpd X	1 day X	1 hr	=	47	gpm		
			ERU	24 hr	60 min.					
					Total Required Retail Water Right	=	**1,239**	**gpm**	**1,998.4**	**Acft**
					Existing Minden Water Right				**10,685.7**	**Acft**
					Total Retail Water Right Available				**8,687.3**	**Acft**
Wholesale (Average Usage)						=	**3,082**	**gpm**		
					Required Wholesale Water Right				**4,972.4**	**Acft**
					Existing Wholesale Water Right				**6,928.2**	**Acft**
					Total Water Right Available				**1,955.8**	**Acft**

Finally, projecting growth to the vested connections planning horizon and using the same method of calculating water rights demand reveals that the Town will have sufficient water rights even after providing water to all connections which are currently vested in the system (see Table 3-6).

The projections also show that existing wholesale water rights will be sufficient through the 20-year planning horizon as shown in Table 3-6. The projected wholesale usage was assumed to have a 1% growth similar to the projected growth in the Town of Minden.

Table 3-6: Required Water Right (Vested Connections Planning Horizon)

Residential									
2,213	ERU's X	656	gpd X	1 day X	1 hr	=	1008	gpm	
			ERU	24 hr	60 min.				
Commercial									
1,216	ERU's X	656	gpd X	1 day X	1 hr	=	554	gpm	
			ERU	24 hr	60 min.				
Other									
136	ERU's X	656	gpd X	1 day X	1 hr	=	62	gpm	
			ERU	24 hr	60 min.				
					Total Required Retail Water Right	=	**1,624**	**gpm**	**2,619.3** **Acft**
					Existing Minden Water Right				**10,685.7** **Acft**
					Total Retail Water Right Available				**8,066.4** **Acft**
Wholesale (Average Usage)						=	**4,073**	**gpm**	
					Required Wholesale Water Right				**6,569.9** **Acft**
					Existing Wholesale Water Right				**6,928.2** **Acft**
					Total Water Right Available				**358.2** **Acft**

Figure 3-1 for the required retail water right and Figure 3-2 for the required wholesale water right illustrate the information given in the tables graphically; namely, it demonstrates that the Town has sufficient water rights even through the vested connections planning period.

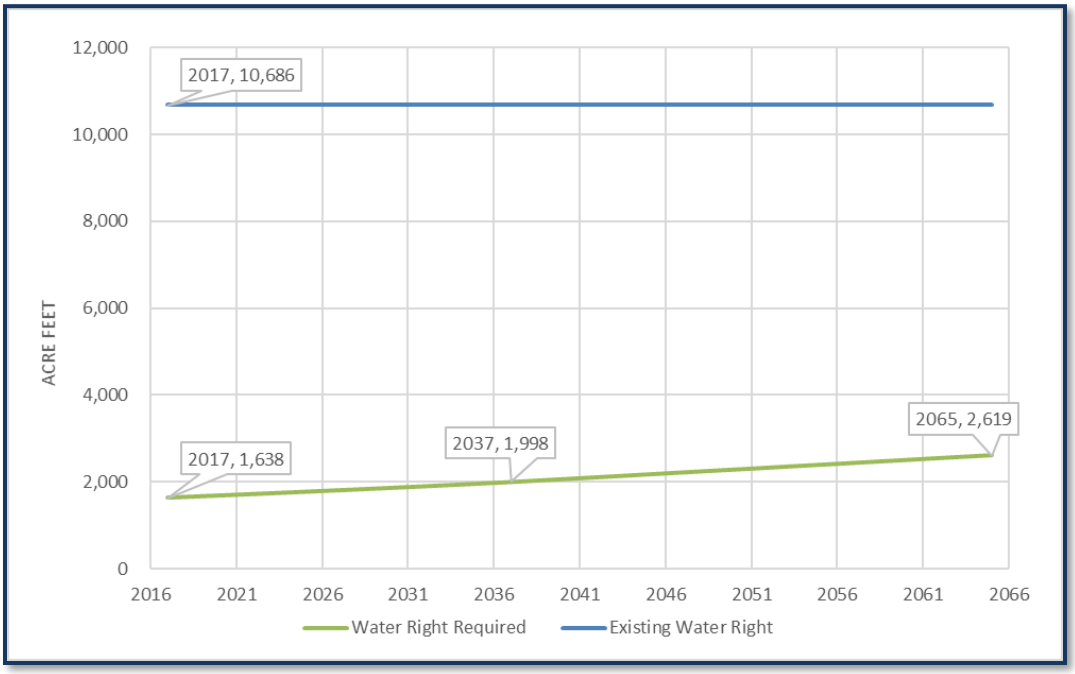


Figure 3-1: Water Right Demand vs. Availability - Retail

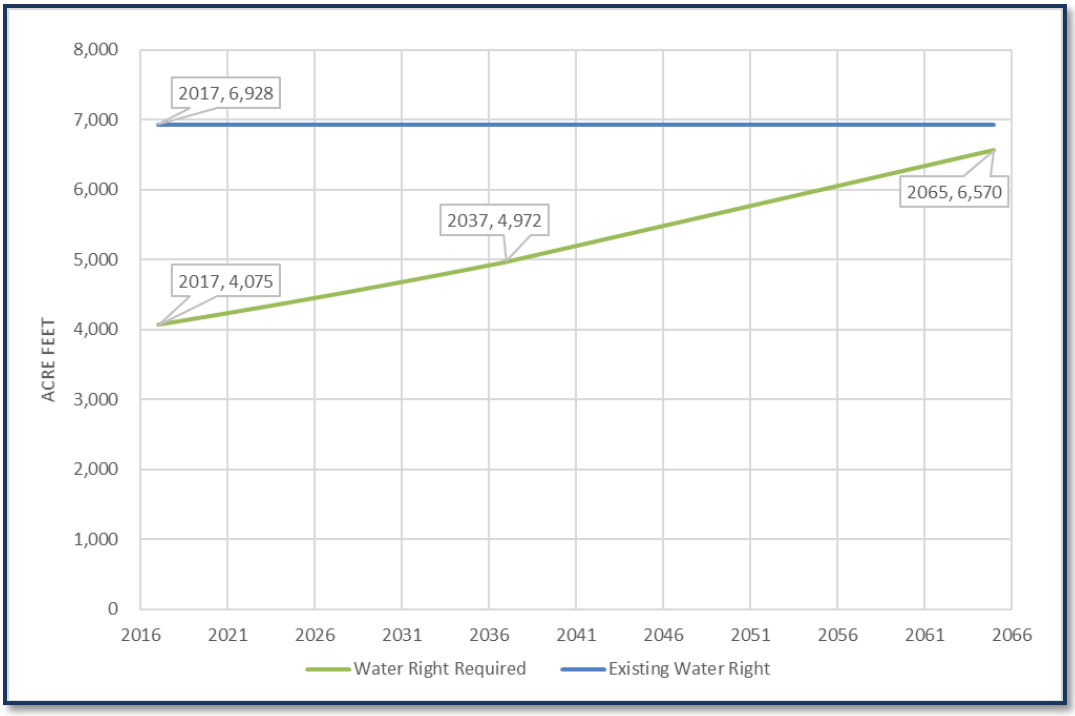


Figure 3-2: Water Right Demand vs. Availability - Wholesale

3.4 Recommended Water Right Improvements

Water rights recommendations are not in the scope of this report. For these recommendations, please refer to previous water rights studies.

4 SOURCE CAPACITY & TOTAL CAPACITY ANALYSES

The source capacity of a water system generally refers to the system's ability to supply the water needed to satisfy demands on an ongoing basis. It should be noted that source capacity is different from water rights capacity. Water right capacity refers to a system's legal right to divert water from environmental sources in the public domain and use them in the utility. Source capacity refers to a system's ability to extract the water for which it has a right to use and make it available for consumption in the utility. For an understanding of the source locations within the system, see Appendix A.

A water system that relies exclusively on water wells as its source of water is required by the NAC that the "Total Capacity" of the system be evaluated and defines this as "the capacity of a public water system to supply the water demanded by its customers within its area of service during all conditions except emergencies" (NAC 445A.6652).

4.1 Existing Source Capacity

To analyze source capacity, all available sources must first be identified and their water production rates quantified. Due to the high levels of arsenic in Well #7 it is not included in the existing capacity for this report.

Table 4-1 below identifies the Town's existing sources and their capacities. Due to the high levels of arsenic in Well #7 it is not included in the existing capacity for this report.

Table 4-1: Sources

Existing Source Capacity:		
Well #2	2,400	gpm
Well #3	2,000	gpm
Well #4	1,850	gpm
Well #5	1,450	gpm
Well #8	1,100	gpm
Well #9	1,750	gpm
Well #10	2,000	gpm
Well #11	1,700	gpm
Existing Source Capacity	**14,250**	**gpm**
Well #7 (not included in ex. capacity)	1,250	gpm

4.2 Existing Total Capacity

Because the Town of Minden water system relies exclusively on wells as the primary source of water, existing total capacity must be analyzed. Total Capacity must be sufficient to meet the maximum day plus fire flow demand when all of the facilities of the system are functioning; or the average day plus fire flow demand when the most productive well of the system is not functioning.

When evaluating the total capacity with regard to the requirements of maximum day demands, NAC 445A.66725.1 requires that "alternative pumping capacity" and storage capacity be considered as sources of supply. Therefore, the total capacity will consist of the sum of the storage capacity and the source capacity of each well that has the capability of backup power generation. The source capacity is converted to gallons by assuming the well is pumped for an entire day. The existing total capacity is summarized in Table 4-2 below. Because wells 2, 7, and 11 do not have backup power generation, they are not included in the calculation of existing total capacity.

Table 4-2: Existing Total Capacity

Existing Total Capacity:				
Well #2 (No backup power supply)	2,400	gpm	0	gal
Well #3	2,000	gpm	2,880,000	gal
Well #4	1,850	gpm	2,664,000	gal
Well #5	1,450	gpm	2,088,000	gal
Well #8	1,100	gpm	1,584,000	gal
Well #9	1,750	gpm	2,520,000	gal
Well #10	2,000	gpm	2,880,000	gal
Well #11 (No backup power supply)	1,700	gpm	0	gal
Total Existing Storage			2,500,000	gal
Existing "Total" Capacity			**17,116,000**	**gal**

4.3 Existing Required Source Capacity and Total Capacity

Source capacity is typically analyzed based on maximum day demands without including the addition of fire flows. The source capacity demand for the Town's system was calculated by multiplying the maximum day demand water use per ERU from Table 2-7 by the total number of ERUs existing in the system.

As stated previously, total capacity is based on the more stringent of maximum day demand with fireflow or average day demand with fire flow assuming the most productive well is out of operation. The maximum day plus fire flow scenario is the more stringent scenario for this report and will therefore be shown as the total capacity. The maximum day plus fire flow scenario governs because the Town of Minden has multiple wells and does not have one well that supplies the majority of the source capacity. The average day demand is 50% of the maximum day demand and the highest producing source, Well #2, is only approximately 17% of the total source capacity.

The average day plus fire flow scenario will therefore not govern based on the current state of the water system.

The calculations for the analysis are shown in Table 4-3. The results of the analysis are presented in gallons per minute (gpm) for source capacity and gallons for total capacity. When compared with the Town's existing source capacity summarized in Table 4-1 and existing total capacity in Table 4-2, it becomes apparent that the Town has sufficient total source capacity under existing growth conditions. For source capacity and total capacity, the capacity required for just Minden connections (retail) and the combined capacity required for retail and wholesale use are both shown.

Table 4-3: Required Source Capacity and Total Capacity (Existing Conditions)

Existing Required Source & Total Capacity Based On Maximum Day + Fire Requirements										
Residential	1314 gpd / ERU	X	1,387	ERU	=	1,822,783	gpd			
Commercial	1314 gpd / ERU	X	757	ERU	=	995,072	gpd			
Other	1314 gpd / ERU	X	85	ERU	=	111,083	gpd			
Fire	1500 gpm	X	60 min / 1 hr	X	2 hr	=	180,000	gal.		
Wholesale (Estimated based on max. month)							8,256,417	gpd		

Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Existing Required Source Capacity	2,034	7,768	gpm
Total Sources of Supply	14,250	14,250	gpm
Existing Source Capacity Available/(Deficit)	12,216	6,482	gpm

Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Existing Required Total Capacity	3,108,937	11,365,355	gal.
Total Capacity based on NAC 445A.66725.1	17,116,000	17,116,000	gal.
Existing Total Capacity Available/(Deficit)	14,007,063	5,750,645	gal.

4.4 Projected Required Source Capacity and Total Capacity

Projecting growth to the various planning horizons and using the same method of calculating source capacity demand reveals that the Town will have available source capacity for all planning horizons, as shown in Table 4-4, Table 4-5, and Table 4-6 below. The projected required source capacity was found in the same way as the existing required sourced capacity; however, the number of ERUs were changed to reflect growth.

Similarly to what was shown on existing capacity, the capacity required for just Minden connections (retail) and the combined capacity required for retail and wholesale use are both shown.

Table 4-4: Required Source Capacity (5-Year Planning Horizon)

Projected (2022) Required Source & Total Capacity Based On Maximum Day + Fire Requirements											
Residential	1314	gpd / ERU	X	1,458	ERU	=		1,915,763	gpd		
Commercial	1314	gpd / ERU	X	796	ERU	=		1,045,831	gpd		
Other	1314	gpd / ERU	X	89	ERU	=		116,749	gpd		
Fire	1500	gpm	X	60 min / 1 hr	X	2	hr =	180,000	gal.		
Wholesale (Estimated based on max. month)								8,677,578	gpd		

Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Projected Required Source Capacity	2,138	8,164	gpm
Total Sources of Supply	14,250	14,250	gpm
Projected Source Capacity Available/(Deficit)	12,112	6,086	gpm

Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Projected Required Total Capacity	3,258,342	11,935,920	gal.
Total Capacity based on NAC 445A.66725.1	17,116,000	17,116,000	gal.
Projected Total Capacity Available/(Deficit)	13,857,658	5,180,080	gal.

Table 4-5: Required Source Capacity (20-Year Planning Horizon)

Projected (2037) Required Source & Total Capacity Based On Maximum Day + Fire Requirements											
Residential	1314	gpd / ERU	X	1,693	ERU	=		2,224,141	gpd		
Commercial	1314	gpd / ERU	X	924	ERU	=		1,214,177	gpd		
Other	1314	gpd / ERU	X	103	ERU	=		135,542	gpd		
Fire	1500	gpm	X	60 min / 1 hr	X	2	hr =	180,000	gal.		
Wholesale (Estimated based on max. month)								10,074,398	gpd		

Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Projected Required Source Capacity	2,482	9,478	gpm
Total Sources of Supply	14,250	14,250	gpm
Projected Source Capacity Available/(Deficit)	11,768	4,772	gpm

Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Projected Required Total Capacity	3,753,860	13,828,258	gal.
Total Capacity based on NAC 445A.66725.1	17,116,000	17,116,000	gal.
Projected Total Capacity Available/(Deficit)	13,362,140	3,287,742	gal.

Table 4-6: Required Source Capacity (Vested Connections Planning Horizon)

Projected Vested (2065) Required Source & Total Capacity Based On Maximum Day + Fire Requirements									
Residential	1314	gpd / ERU	X	2,213	ERU	=	2,908,023	gpd	
Commercial	1314	gpd / ERU	X	1,216	ERU	=	1,597,920	gpd	
Other	1314	gpd / ERU	X	136	ERU	=	178,380	gpd	
Fire	1500	gpm	X	60 min / 1 hr	X	2 hr	=	180,000	gal.
Wholesale (Estimated based on max. month)							13,311,211	gpd	

Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Projected Required Source Capacity	3,253	12,497	gpm
Total Sources of Supply	14,250	14,250	gpm
Projected Source Capacity Available/(Deficit)	10,997	1,753	gpm
Retail = Retail Only, R&W = Retail & Wholesale	**Retail**	**R&W**	
Projected Required Total Capacity	4,864,322	18,175,534	gal.
Total Capacity based on NAC 445A.66725.1	17,116,000	17,116,000	gal.
Projected Total Capacity Available/(Deficit)	12,251,678	(1,059,534)	gal.

Figure 4-1 below illustrates the source capacity demand increasing over time through the vested planning period.

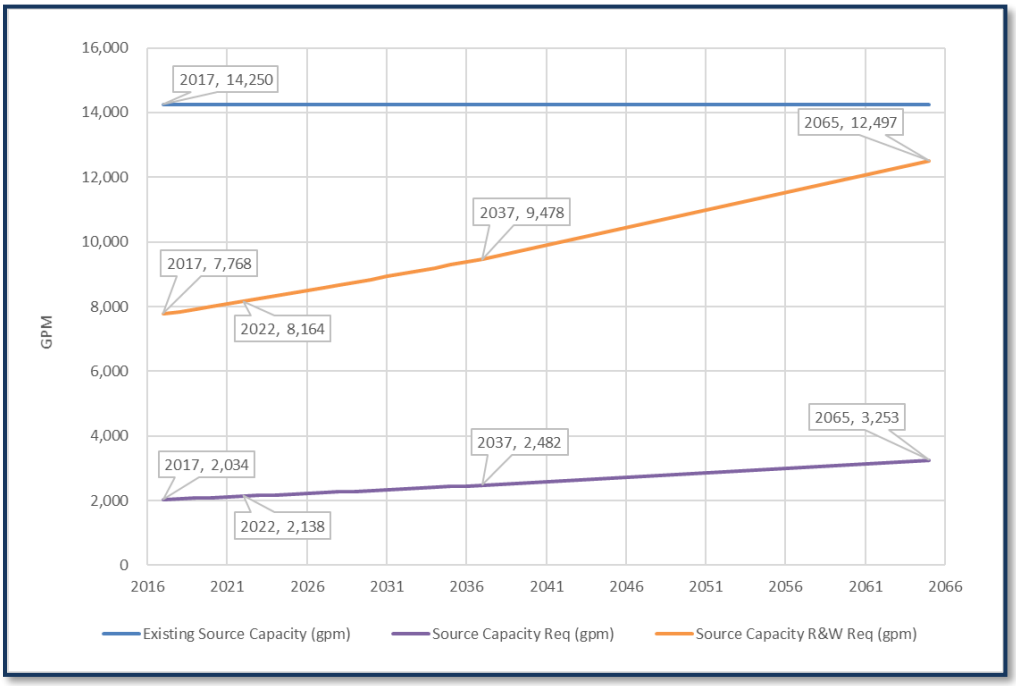


Figure 4-1: Source Demand vs. Capacity

Total capacity was also shown to be adequate in the future with the exception of the scenario of vested connections (2065) considering retail and wholesale demands.

Figure 4-2 below illustrates the source capacity demand increasing over time through the vested planning period.

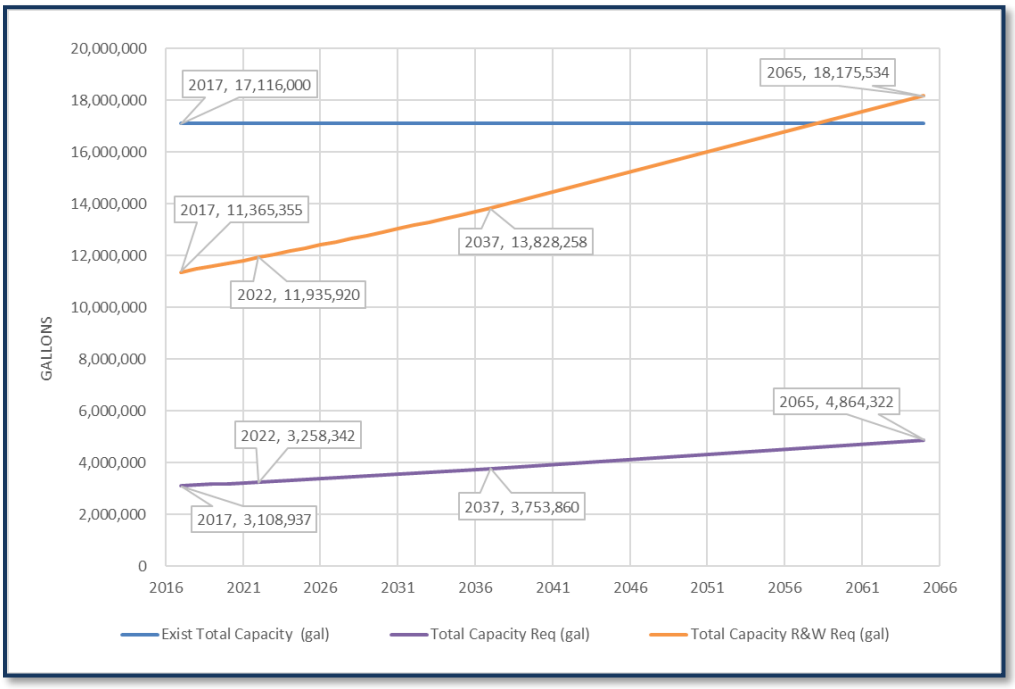


Figure 4-2: Total Capacity Required vs. Total Capacity Available

4.5 Key Source Considerations

While the analysis completed in Section 4.4 demonstrates that the Town has sufficient total source capacity in terms of quantity for the planning period and beyond, there are a number of key considerations that affect the recommendations of this report relative to source capacity, as follows:

- The Town provides wholesale water to neighboring communities. Although analyzing the wholesale water is not in the scope of the report, the report does show capacities based on assumed wholesale use. The wholesale water has risen significantly over the last 5 years. The report assumes a 1% growth of the wholesale water at the same rate of growth as the Town. If the amount of wholesale water increases significantly throughout the planning period, this will significantly alter the available source capacity. These amounts are determined based on contracts with the Town for wholesale water and future board decisions.
- Multiple wells (Wells 7 and 8) have higher levels of arsenic than desired and are therefore rarely pumped. Although this source capacity has been considered for the capacity of the report, they are not as valuable as the other wells in the system.

4.6 Recommended Source Capacity Improvements

By the total numbers provided in Table 4-3, Table 4-4, Table 4-5, and Table 4-6, the Town has sufficient source capacity to meet its current and essentially all projected demand obligations. However, there are some aspects of the sources that suggest the following improvements:

- Where possible, provide backup power generation for the remaining well sites that currently have no backup power. This will also increase the alternative pumping capacity available as shown in Section 5.7.
- Obtain a portable generator which can power any of the wells where backup power generation is not possible.
- Although a new source may not be required within the 20-year planning period due to source capacity, the City should evaluate the need for a new well based on logistics of well operation and redundancy requirements. For example, the Town currently has a designated area for a future well in the Ranch at Gardnerville subdivision. This well would provide more redundancy in capacity for future growth, but would also provide for redundancy in the distribution system for areas being served by a single transmission line (such as the Ranch at Gardnerville subdivision). This will also increase the alternative pumping capacity available as shown in Section 5.7.

Please keep in mind that the existing source capacity and total capacity rely on data provided by the Town and these capacities may change over time based on the level of the aquifer and as wells are added nearby. The capacity of each well would likely decrease if all wells are run simultaneously due to combined influence of all wells on the aquifer. A detailed groundwater model and test pump data could provide greater insight into the effect of multiple wells being pumped at the same time and the effect they would have on each other.

5 STORAGE CAPACITY ANALYSIS

5.1 Code Requirements

The Nevada Administrative Code (NAC) 445A.6674-6675 requires that "an existing public water system maintains a storage capacity that, as determined by an engineer on the basis of historical data, accepted engineering judgment and a network hydraulic analysis, is sufficient to ensure that the total capacity of the public water system will meet current and anticipated demands for water while maintaining the pressures indicated in NAC 445A.6711", which outlines pressure and flow performance requirements of a system. In addition, "storage requirements for fire demand must be calculated according to the requirements of the fire authority" and "an existing public water system must maintain an operating storage in such an amount as an engineer determines, based upon historical data and the system's capacity for the development and treatment of water, to be sufficient for the system to meet requirements for maximum day demand." Finally, "an existing public water system must maintain an emergency reserve in such an amount as an engineer determines appropriate on the basis of the best available local information."

The code also provides an exemption from the Section 445A.6674-6675: "An existing public water system is not required to comply with the requirements of NAC 445A.6674, 445A.66745 and 445A.6675 if the system has a sufficient alternative pumping capacity to meet requirements for maximum day demand, peak hour demand and fire flow."

5.2 Existing Storage Capacity

The Town currently possesses in its water system one storage tank, as summarized in Table 5-1 below. The Amber tank was completed recently and serves to provide storage capacity for the system and stabilize possible demand fluctuations which may occur in the system throughout the day. The Amber Tank is a partially buried concrete tank located outside of the town boundaries at an elevation that can serve the rest of the town. Water is pumped to the tank at the Buckeye booster station and water is returned from the tank through pressure reducing valves located in the same building. Water from the tank should be able to gravity feed to any connection in the town. The location of the tank in the Town's system can be seen on the maps in Appendix A.

Table 5-1: Existing Storage Capacity

Existing Storage Capacity:		
Amber Tank	2,500,000	gal.
Total Existing Capacity	**2,500,000**	**gal.**

5.3 Total Capacity

See Section 4 regarding "Total capacity."

5.4 Existing Required Storage Capacity

Storage capacity requirements for public water systems are found in NAC 445A.6674, as quoted previously. In general, the regulation requires sufficient storage to ensure that the total capacity of the system meets its demands while maintaining required pressures throughout the system. More specifically, the regulation requires that the operating storage be sufficient for maximum day demand, with fire flows and an adequate emergency reserve. This section will present the Town's status as it relates to NAC 445A.6674-6675; however, Section 5.7 will show that the Town is exempt from these requirements.

The calculation for maximum day demand, with a peaking factor of 2.0, was summarized in Table 2-7. In addition, Section 2.8 discussed the fire flow requirement and established the value at 1,500 gpm for this analysis.

The storage capacity demand for the Town's system was calculated by multiplying the maximum day water use per ERU from Table 2-7 by the total number of ERUs currently existing in the system. A summary of a comparison with the Town's current storage capacity is presented in Table 5-2. Wholesale demand will not be considered in the required storage capacity because wholesale customers are expected to maintain adequate storage capacity for themselves.

Table 5-2: Required Storage Capacity (Existing Conditions)

Existing (2017) Required Storage Capacity Based On Maximum Day + Fire Requirements										
Residential	1314	gpd / ERU	X	1,387	ERU		=	1,822,783	gpd
Commercial	1314	gpd / ERU	X	757	ERU		=	995,072	gpd
Other	1314	gpd / ERU	X	85	ERU		=	111,083	gpd
Fire	1500	gpm	X	60 / 1	min / hr	X 2	hr =	180,000	gal.
						Existing Required Storage Capacity		3,108,937	gal.
						Total Existing Storage Capacity		2,500,000	gal.
						Existing Storage Capacity Deficit		(608,937)	gal.

The calculation shows that the Town has a deficit storage capacity under existing growth conditions. The amount of emergency storage present will be presented in Section 5.6.

5.5 Projected Required Storage Capacity

Projected required storage capacity at the end of the planning period is determined from the same factors explained in Section 5.4 above, but the projected number of ERUs is inserted into the calculations. Calculations for growth at the 5-year and 20-year planning horizons show that the Town will have a deficit in total storage capacities. The calculations are as summarized in Table 5-3, Table 5-4, and Table 5-5.

Table 5-3: Required Storage Capacity (5-Year Planning Horizon)

Projected (2022) Required Storage Capacity Based On Maximum Day + Fire Requirements										
Residential	1314	gpd / ERU	X	1,458	ERU		=	1,915,763	gpd
Commercial	1314	gpd / ERU	X	796	ERU		=	1,045,831	gpd
Other	1314	gpd / ERU	X	89	ERU		=	116,749	gpd
Fire	1500	gpm	X	60 / 1	min / hr	X 2 hr	=	180,000	gal.
						Projected Required Storage Capacity		3,258,342	gal.
						Total Existing Storage Capacity		2,500,000	gal.
						Projected Storage Capacity Deficit		(758,342)	gal.

Table 5-4: Required Storage Capacity (20-Year Planning Horizon)

Projected (2037) Required Storage Capacity Based On Maximum Day + Fire Requirements										
Residential	1314	gpd / ERU	X	1,693	ERU		=	2,224,141	gpd
Commercial	1314	gpd / ERU	X	924	ERU		=	1,214,177	gpd
Other	1314	gpd / ERU	X	103	ERU		=	135,542	gpd
Fire	1500	gpm	X	60 / 1	min / hr	X 2 hr	=	180,000	gal.
						Projected Required Storage Capacity		3,753,860	gal.
						Total Existing Storage Capacity		2,500,000	gal.
						Projected Storage Capacity Deficit		(1,253,860)	gal.

Table 5-5: Required Storage Capacity (Vested Connections Planning Horizon)

Projected Vested (2065) Required Storage Capacity Based On Maximum Day + Fire Requirements									
Residential	1314	gpd / ERU	X	2,213	ERU		=	2,908,023	gpd
Commercial	1314	gpd / ERU	X	1,216	ERU		=	1,597,920	gpd
Other	1314	gpd / ERU	X	136	ERU		=	178,380	gpd
Fire	1500	gpm X	60 / 1	min / hr X	2	hr	=	180,000	gal.
						Projected Required Storage Capacity		4,864,322	gal.
						Total Existing Storage Capacity		2,500,000	gal.
						Projected Storage Capacity Deficit		(2,364,322)	gal.

Figure 5-1 illustrates how total storage capacity in the existing system will be absorbed throughout all planning horizons.

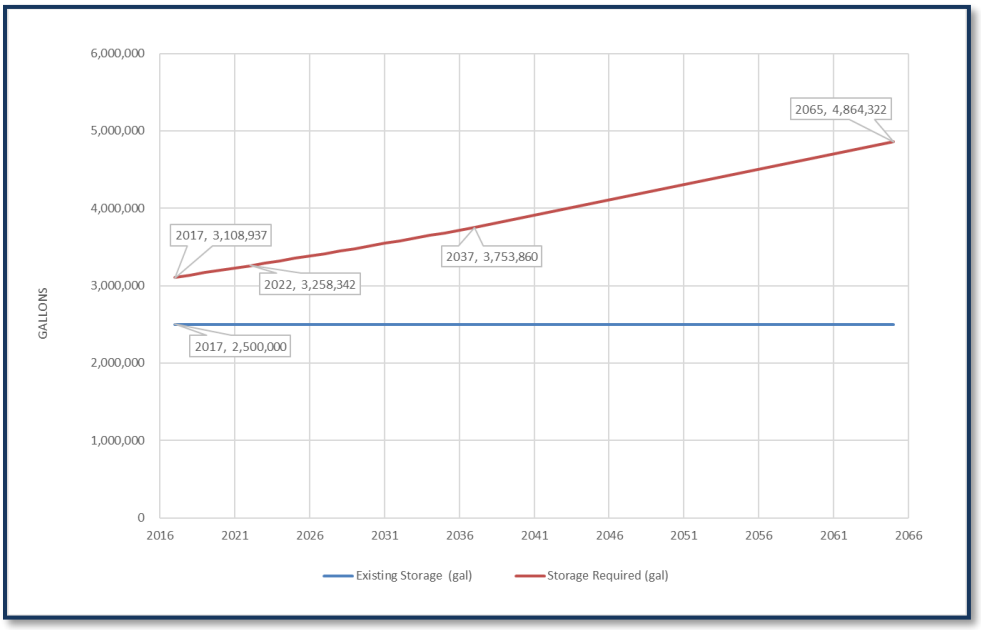


Figure 5-1: Storage Demand vs. Availability

5.6 Emergency Reserve Capacity

The Nevada Administrative Code (NAC) 445A.6675 requires that "an existing public water system must maintain an emergency reserve in such an amount as an engineer determines appropriate on the basis of the best available local information" and "a new public water system must

maintain an emergency reserve equal to 75 percent of the amount of operating storage of the system." The Town's system is an existing system, but the 75% rule is a good starting point for analysis.

There are multiple factors that inform the emergency reserve capacity question as follows:

- As outlined in Section 4, the Town has adequate source capacity and total capacity.
- The Town also has backup power generation capability on the majority of their wells. This would imply a lower emergency reserve than perhaps for other communities.

Where the Town is currently not meeting existing storage requirements, the Town has 0% emergency reserve through the planning period.

The NAC requires that "an existing public water system must maintain an emergency reserve in such an amount as an engineer determines appropriate on the basis of the best available local information". Considering the 75% reserve capacity rule of thumb for new systems and the factors listed previously, this report recommends an emergency reserve of 50% of the required operating storage.

5.7 Exemption from Storage Capacity Requirements

As stated in Section 5.1, the Town may be exempt from the storage capacity requirements in this section if it provides sufficient alternative pumping capacity to meet requirements for maximum day demand, peak hour demand and fire flow. The "alternative pumping capacity" includes the wells with a backup power supply (Wells 3, 4, 5, 8, 9, and 10). These wells add up to 10,150 gpm. Where the peaking factor for the maximum day demand is 2.0 and the peaking factor for the peak hour demand is 4.0 (see Section 2.7), the peak hour demand requirements can be found by multiplying the maximum day demand requirements by 2. These requirements are shown in Table 5-6 below:

Table 5-6. Alternative Capacity Requirement

	Max. Day Demand	Fire Flow	Wholesale	Total	Additional/Deficit
Existing	2,034	1,500	5,734	9,268	882
2022	2,138	1,500	6,026	9,664	486
2037	2,482	1,500	6,996	10,978	(828)
2065	3,253	1,500	9,244	13,997	(3847)
	Peak Hour Demand	**Wholesale**	**Total**	**Additional/Deficit**	
Existing	4068	5,734	9,802	348	
2022	4275	6,026	10,302	(152)	
2037	4964	6,996	11,960	(1810)	
2065	6506	9,244	15,750	(5600)	

As can be seen in the table, the Town currently meets the requirement for the exemption under maximum day demand and fireflow and peak hour demand. However, the Town will need an additional 1,810 gpm "alternative source capacity" prior to the end of the 20-year planning period (2037). Section 4 already recommends a portable generator and a new well which would

increase the alternative pumping capacity. This section recommends that the backup power generation for the existing wells be made a high priority improvement (prior to the year 2022). The additional well recommended in Section 4 will also increase the alternative pumping capacity, provided it is equipped with backup power generation.

5.8 Recommended Storage Capacity Improvements

The analysis presented in this section shows that Town needs additional storage prior to the end of the 20-year planning horizon to meet the state requirements. Recommendations are as follows:

- The portable generator recommended in Section 4 should be made a high priority improvement and completed within 5 years.
- As additional tanks are built in the system, it is important that they be placed strategically so that all of the Town's storage capacity is not reliant on one transmission line.

6 TREATMENT CAPACITY ANALYSIS

6.1 Code Requirements

The State of Nevada, in accordance with the National Safe Drinking Water Act, has adopted the National Primary Drinking Water Regulations for the protection of public health, and Secondary Standards related to taste and aesthetics.

The Nevada Administrative Code (NAC) 445A.6676 generally requires that the development or treatment of a source of water for a public water system must comply with the applicable provisions of the NAC, and:

- Any source of water selected for development must contain a sufficient quantity of available water to ensure that the total capacity of the public water system is adequate.
- Any water intended to be supplied to users of the public water system shall meet applicable code-required standards for microbiological, physical, chemical and radiological quality.
- A supplier of water shall, within any applicable economic, technical and legal limitations, obtain water from the best source available.

These general requirements serve as the basis for ensuring the health and safety of the public as served by the public water system. Other more specific requirements of the NAC also apply. Specifically, the NAC requires continuous disinfection for groundwater used by the public water system if the water does not comply with primary standards naturally.

6.2 Existing Treatment Facilities

Currently the only existing treatment facilities are in the Heybourne Booster Station building. There the Town operates a sodium hypochlorite chlorination system which provides a chlorine residual for the wholesale water as it is being pumped to the wholesale customers. The sodium hypochlorite solution is delivered to the building in bulk.

There is currently no disinfection of the retail use due to the high quality of the groundwater and historical success of meeting the primary standards naturally.

6.3 Future Disinfection Needs

Currently the setup of wells throughout the system is spread out. While this is ideal for redundancy purposes of providing water to the system, it could make chlorination difficult if it were ever required or desirable to disinfect the retail water. Chlorination is the desired form of disinfection due to the chlorine residual it provides in the system. Although there are alternatives for chlorination or alternative forms of disinfection locally at each site, it is ideal to have a separate feed line from the wells to the tanks. This not only provides contact time for the chlorination, but it also provides circulation in the tanks as water is forced to move through the tanks to the distribution system.

6.4 Arsenic

Currently the wells on the east side of the system, Well #7 and Well #8 have higher than desired levels of arsenic. Well #7 is rarely used and is basically only available for emergency situations. If the Town desires to use Well #7 in the future due to increased need for source capacity, there are options available to the Town:

- Treatment – there currently are options for treating water high in arsenic; however, these options are generally expensive in both capital and on-going maintenance costs. Potential treatment options are as follows:
    - Ion exchange
    - Activated alumina
    - Iron based sorbents
    - Coagulation assisted microfiltration
    - Coagulation assisted direct filtration
    - Oxidation/filtration

  A detailed analysis of the arsenic treatment options is not included in this report. If treatment of the arsenic were ever desired, a more detailed analysis of the treatment options would be warranted.
- Sidestream Treatment – this form of treatment only treats a portion of the high arsenic water and then blends the treated portion with the remaining portion. This form of treatment could be beneficial for Well #8 as it is lower in arsenic, Well #7 has a high enough arsenic concentration that sidestream treatment would not be highly beneficial.
- Blending – A common practice for water high in arsenic is to blend the high arsenic water with water that contains lower levels of arsenic. To accomplish this, the Town would need a separate line running to the Amber Tank, or at least beyond the nearest connection to the tank. The system would then need to be set up so that the wells only run when water can be pumped at the Buckeye Booster Station to ensure that the water to the tank is mixed. Although running a new line to the tank may not be a cost-effective option, running a new line beyond the nearest connection to the tank could be feasible. This option could potentially require significant control so as to ensure proper blending takes place.
- Conversion to Irrigation – this option would reduce the source capacity; however, it could provide a means for utilizing the well. There is the possibility of a park near this well and the well could be used to irrigate the park.
- Source Abandonment – this option is not desirable because then the well would not be of use for emergency scenarios or to use for irrigation.

6.5 Recommended Treatment Facility Improvements

The information presented in this section suggests that few improvements relative to treatment capacity are needed within the foreseeable future, the Town should plan around the potential future need to provide chlorination and arsenic treatment in the system. Below are several general recommendations:

- The current setup for the chlorination of the wholesale water is maintenance intensive and the reliance on delivery of sodium hypochlorite solution is not ideal. The Town may look into reconfiguring the setup of the chlorination facilities including changing to on-site sodium hypochlorite or chlorine gas.
- Design the locations of any future improvements such as wells and tanks so that the water can be easily chlorinated and ran directly from the well to the tank if that ever becomes required or desired.

7 DISTRIBUTION SYSTEM ANALYSIS

7.1 System Background

The Town of Minden operates a water system that generally includes 11 wells, 1 tank, 2 booster stations, 2 pressure reducing valves, 372 fire hydrants, 936 valves, and 48 miles of transmission and distribution pipe ranging in size from 2 inches to 30 inches. The system is operated in 2 distinct pressure zones, serving connections at elevations from approximately 5,044 feet down to 4,694 feet above sea level.

7.2 Existing Distribution System Status

The Town has multiple pipe segments of pipe over 100 years old in the ground. Although in recent years the Town has made it a priority to replace all pipe installed prior to 1960, there are still pipes in the ground installed prior to 1960. The Town desires to replace all pipe installed prior to 1960 within the next two years. This is a recommended improvement on the 5-year list.

Certain segments of the Town's system consist of asbestos-cement (AC or Transite) pipe, which contain asbestos fibers. While the asbestos contained in these water pipes is not likely to become airborne and cause respiratory disease, there are some conditions in which the pipe may deteriorate, leaching asbestos fibers into the water. The Town's personnel must follow strict guidelines when repairing segments of asbestos cement pipe. Additionally, the expected life of asbestos pipe is approximately 50 years. Much of the asbestos pipe in the system is approaching the end of its expected design life. All of these factors combine to the conclusion that replacing asbestos cement pipe is a priority for the system. During removal and/or repair, the Town should be diligent in following the National Emissions Standards for Hazardous Air Pollutants (NESHAP) guidelines as it refers to asbestos pipe.

The Town currently meters only a fraction of the connections to the system. It is highly recommended that the Town meter all connections to encourage conservation and to properly account for the water in the town. The Town would like to meter every connection by 2025. They would need to install approximately 100 meters per year to accomplish this. They currently have 740 meters remaining to meet this goal.

7.3 Distribution System Standards and Guidelines

Basic standards by which the hydraulic and fire flow capacity of a distributions system are measured are derived through rule-of-thumb experience and governing-agency codes.

First, as a rule of thumb, static pressures in a distribution system should generally be maintained between 50 and 90 psi during normal operations.

Second, under the rules of the Nevada Administrative Code (NAC) 445A.6672, three pressure conditions must be met to demonstrate adequate service capacity of a system, as follows:

- At least 40 psi must be retained as residual pressure in the distribution system under maximum day demand conditions.

- At least 30 psi must be retained as residual pressure in the distribution system under peak hour demand conditions.
- At least 20 psi must be retained as residual pressure in the distribution system under maximum day demand plus fire flow conditions.

In addition, NAC 445A.67115 provides some guidance regarding design of pipe sizes in the system. Except as otherwise authorized, "the inside diameter of the water mains of a public water system must have a nominal size of at least 6 inches." Hydrant laterals also must be at least 6" in diameter if less than 150' in length and larger based on a hydraulic analysis if greater than 150'. This rule also states that fire hydrants must not be connected to a water main or water service lateral that does not have sufficient capacity for fire flow.

Also as a general guideline, it is recommended that fire hydrants have an average spacing of approximately 500 ft. Hydrants are usually located at street intersections and can also be located at intermediate points between intersections or as agreed between water utilities and local fire authorities.

7.4 Basic System Demands

The demands per ERU for maximum day demand, peak hour demand, and maximum day demand with fire flow were determined according to the description previously provided in Section 2.7 of this report.

The total existing flow demands based on the criteria outlined above are calculated in Table 7-1. Similar calculations were also performed to determine the projected 5-year, 20-year, and vested connections planning horizons. These flow demands and calculations are shown in Table 7-2, Table 7-3, and Table 7-4 respectively.

7.5 Network Hydraulic Model

The Nevada Administrative Code (NAC) defines *Network Hydraulic Analysis* as "the engineering process used to determine the pressure and flow for an existing or proposed networked system of water mains and appurtenances" and requires that such an analysis be performed to demonstrate the need and viability of certain water system improvements.

A network hydraulic model is a digital, computer-based, representation of a water system with the capability of calculating pressures and flows at nodes in the model, per the NAC requirement. The intent of a network hydraulic model is to analyze performance of a system under minimum code requirements and to explore alternatives that either improve the operation of the system or help define the operational envelope under which the system functions.

Table 7-1. Existing Distribution Requirements

Existing Distribution Requirements Based On Maximum Day + Fire Requirements (maintain 20 psi)								
Residential	1314	gpd / ERU	X	1,387	ERU	=	1,822,783	gpd
Commercial	1314	gpd / ERU	X	757	ERU	=	995,072	gpd
Other	1314	gpd / ERU	X	85	ERU	=	111,083	gpd
					Total Maximum Day Water Demand =		2,928,937	gpd
						=	**2,034**	**gpm**
Fire							1,500	gpm
					Distribution Requirement for Peak Day + Fire =		**3,534**	gpm
Existing Distribution Requirements Based On Peak Hour Demand (maintain 30 psi)								
Residential	2623	gpd / ERU	X	1,387	ERU	=	3,639,469	gpd
Commercial	2623	gpd / ERU	X	757	ERU	=	1,986,815	gpd
Other	2623	gpd / ERU	X	85	ERU	=	221,794	gpd
					Total Peak Hour Water Demand =		5,848,078	gpd
					Distribution Requirement for Peak Hour =		**4,061**	**gpm**
Existing Distribution Requirements Based On Maximum Day Demand (maintain 40 psi)								
Residential	1314	gpd / ERU	X	1,387	ERU	=	1,822,783	gpd
Commercial	1314	gpd / ERU	X	757	ERU	=	995,072	gpd
Other	1314	gpd / ERU	X	85	ERU	=	111,083	gpd
					Total Peak Hour Water Demand =		2,928,937	gpd
					Distribution Requirement for Maximum Day =		**2,034**	**gpm**

Table 7-2. Projected 5-Year Distribution Requirements

Projected (2022) Distribution Requirements Based On Maximum Day + Fire Requirements (maintain 20 psi)								
Residential	1314	gpd / ERU	X	1,458	ERU	=	1,915,763	gpd
Commercial	1314	gpd / ERU	X	796	ERU	=	1,045,831	gpd
Other	1314	gpd / ERU	X	89	ERU	=	116,749	gpd
					Total Maximum Day Water Demand =		3,078,342	gpd
						=	**2,138**	**gpm**
Fire							1,500	gpm
					Distribution Requirement for Peak Day + Fire =		**3,638**	gpm
Projected (2022) Distribution Requirements Based On Peak Hour Demand (maintain 30 psi)								
Residential	2623	gpd / ERU	X	1,458	ERU	=	3,825,118	gpd
Commercial	2623	gpd / ERU	X	796	ERU	=	2,088,163	gpd
Other	2623	gpd / ERU	X	89	ERU	=	233,107	gpd
					Total Peak Hour Water Demand =		6,146,388	gpd
					Distribution Requirement for Peak Hour =		**4,268**	**gpm**
Projected (2022) Distribution Requirements Based On Maximum Day Demand (maintain 40 psi)								
Residential	1314	gpd / ERU	X	1,458	ERU	=	1,915,763	gpd
Commercial	1314	gpd / ERU	X	796	ERU	=	1,045,831	gpd
Other	1314	gpd / ERU	X	89	ERU	=	116,749	gpd
					Total Peak Hour Water Demand =		3,078,342	gpd
					Distribution Requirement for Maximum Day =		**2,138**	**gpm**

Table 7-3. Projected 20-Year Distribution Requirements

Projected (2037) Distribution Requirements Based On Maximum Day + Fire Requirements (maintain 20 psi)								
Residential	1314	gpd/ERU	X	1,693	ERU	=	2,224,141	gpd
Commercial	1314	gpd/ERU	X	924	ERU	=	1,214,177	gpd
Other	1314	gpd/ERU	X	103	ERU	=	135,542	gpd
					Total Maximum Day Water Demand	=	3,573,860	gpd
						=	**2,482**	**gpm**
Fire							1,500	gpm
					Distribution Requirement for Peak Day + Fire	=	**3,982**	gpm
Projected (2037) Distribution Requirements Based On Peak Hour Demand (maintain 30 psi)								
Residential	2623	gpd/ERU	X	1,693	ERU	=	4,440,843	gpd
Commercial	2623	gpd/ERU	X	924	ERU	=	2,424,292	gpd
Other	2623	gpd/ERU	X	103	ERU	=	270,630	gpd
					Total Peak Hour Water Demand	=	7,135,766	gpd
					Distribution Requirement for Peak Hour	=	**4,955**	**gpm**
Projected (2037) Distribution Requirements Based On Maximum Day Demand (maintain 40 psi)								
Residential	1314	gpd/ERU	X	1,693	ERU	=	2,224,141	gpd
Commercial	1314	gpd/ERU	X	924	ERU	=	1,214,177	gpd
Other	1314	gpd/ERU	X	103	ERU	=	135,542	gpd
					Total Peak Hour Water Demand	=	3,573,860	gpd
					Distribution Requirement for Maximum Day	=	**2,482**	**gpm**

Table 7-4. Projected Vested Connections Distribution Requirements

Projected Vested Connections Distribution Requirements Based On Maximum Day + Fire Requirements (maintain 20 psi)								
Residential	1314	gpd / ERU	X	2,213	ERU	=	2,908,023	gpd
Commercial	1314	gpd / ERU	X	1,216	ERU	=	1,597,920	gpd
Other	1314	gpd / ERU	X	136	ERU	=	178,380	gpd
					Total Maximum Day Water Demand =		4,684,322	gpd
						=	**3,253**	**gpm**
Fire							1,500	gpm
					Distribution Requirement for Peak Day + Fire =		**4,753**	gpm
Projected Vested Connections Distribution Requirements Based On Peak Hour Demand (maintain 30 psi)								
Residential	2623	gpd / ERU	X	2,213	ERU	=	5,806,318	gpd
Commercial	2623	gpd / ERU	X	1,216	ERU	=	3,190,494	gpd
Other	2623	gpd / ERU	X	136	ERU	=	356,163	gpd
					Total Peak Hour Water Demand =		9,352,976	gpd
					Distribution Requirement for Peak Hour =		**6,495**	**gpm**
Projected Vested Connections Distribution Requirements Based On Maximum Day Demand (maintain 40 psi)								
Residential	1314	gpd / ERU	X	2,213	ERU	=	2,908,023	gpd
Commercial	1314	gpd / ERU	X	1,216	ERU	=	1,597,920	gpd
Other	1314	gpd / ERU	X	136	ERU	=	178,380	gpd
					Total Peak Hour Water Demand =		4,684,322	gpd
					Distribution Requirement for Maximum Day =		**3,253**	**gpm**

The Town of Minden had a water model prior to contracting with Sunrise Engineering. However, the system had been set up in two separate models and was not located in a specific coordinate system. As part of this report, Sunrise Engineering completed the following regarding the hydraulic model:

- Combined the two models
- Corrected the combined model to be located in a standard coordinate system
- Added nodes so that all identified hydrants were represented
- Fixed any inaccuracies with the pipe sizes and topology
- Added and/or fine-tuned pump curves for wells and booster pumps
- Added pipe age and type attributes to the pipes
- Set up scenarios for each state required demand scenario for existing, 5-year, and vested connections scenarios.
- Placed demands on each scenario. Demands were based on the data presented in Section 7.4. Existing demands were spread across all 581 demand nodes equally. The 5-Year and vested connections scenarios introduced additional nodes to represent future development. The location and percentage of demand placed on these nodes was determined based on discussions with the Town staff and Engineering judgment.
- Added pipes to represent possible future development in the 5-year and vested connections scenarios.
- Ran each scenario and evaluated any deficiencies in the system. The modeling software used was H2ONet® v.13.5 by Innovyze.
- Modeled fire flow based on the fire flow nodes previously incorporated into the model. Of note, the locations of the hydrants are not necessarily the exact location of the hydrants and may not fully represent the exact hydraulic conditions based on hydrant laterals, etc.

7.6 Model Results

Operation of the network hydraulic model revealed that the Town's existing system is generally adequate for meeting the NAC requirements relative to maximum day demands, peak hour demands, and peak hour demands with fire flows as outlined in Section 7.3; namely, the system has the capacity to deliver 40 psi to each demand node under maximum day demands, 30 psi to each demand node under peak hour demands, and 20 psi to the majority of demand nodes under maximum day demand with fire flow. The exception are two areas where hydrants are at the end of long 4" or 6" lines. In both cases, fireflow is still greater than 1,000 gpm, but does not meet the 1,500 gpm requirement set forth in this report.

- Ironwood Dr. near Pinewood Dr. – a hydrant is on the end of a 6" waterline that is longer than 500 feet without looping.
- Highway 395 near Church St. – One hydrant is on a 4" waterline. Replacing these pipes would be relatively challenging due to the location in Highway 395.

Of note, there were very few differences in the model results for the current and 5-year conditions; this is attributable to the relatively low 1.00% assumed annual growth rate and the relatively short 5-year planning horizon.

Therefore, no new deficiencies were identified due to the model. The only recommended improvements from the projected demand scenarios resulted from new demand due to growth. The three growth areas modeled are as follows:

- Ankler Park/Ranch at Gardnerville – This development area is potentially one of the largest areas of growth during the planning horizons of this analysis given the amount of vested connections. Hydraulically, the existing and future connections in the area will meet the State requirements provided that new development install new 8" lines from the existing 45° elbow on Zerolene Rd. to the Heybourne Rd./Buckeye Rd. and Sanford St./Buckeye Rd. intersections. The Town should consider requiring at least one of the connections early on in development. This is primarily due to the single feed line to the current and future development area. The more connections that are on the single feed line, the greater the inconvenience if the line were in need of repair.
- La Costa PD – The planned 8" lines in the planned roadways have been modeled and shown to meet State requirements.
- Monterra PD – When the northern portion of this development is constructed, the 10" line on Sanford St. should be continued northward and looped appropriately.

7.7 Recommended Distribution System Improvements

Operation of the network hydraulic model and the current status of the distribution system described previously became the basis for making improvement recommendations:

- Replace all asbestos cement pipe in the system (20-Year Improvement)
- Replace all pipes installed prior to 1960 (5-Year Improvement)

- Replace all pipes installed prior to 1980 (20-Year Improvement). Because all improvements installed between 1960 and 1980 are asbestos cement pipe, this recommendation overlaps the recommendation to replace all asbestos cement pipe.
- Replace small lines in Ironwood Dr. and Highway 395 causing low fire flows (20-Year Improvement)
- Install a meter and radio read or fixed read capability for each connection (5-Year and 20-Year improvement).
- Install additional hydrants to meet the 500' spacing guideline (5-year).
- Develop up-to-date GIS data to show exact locations of meters, valves, hydrants, and pipe.
- Minimum Mainline Size - It is recommended that the Town establish the minimum standard that all distribution mainline improvements consist of 8-inch pipe, unless a larger size is designated by this analysis or a network hydraulic analysis shows that the water demands of a proposed improvement require a larger transmission line size.

8 SUMMARY, COST & PRIORITIES

8.1 Summary of 5-Point Analysis

Water Rights (Ac-Ft)	Existing Capacity	Required	Available/(Deficit)	Capacity/ERU	# Add. ERUs
Retail Only					
Existing (2017)	10,686	1,638	9,048	0.735	12,310
5-Year (2022)	10,686	1,721	8,964	0.735	12,196
20-Year (2027)	10,686	1,998	8,687	0.735	11,819
Vested Conn. (2065)	10,686	2,619	8,066	0.735	10,975
Wholesale Only					
Existing (2017)	6,928	4,075	2,853		
5-Year (2022)	6,928	4,283	2,645		
20-Year (2027)	6,928	4,972	1,956		
Vested Conn. (2065)	6,928	6,570	358		
Source Capacity (gpm)	Existing Capacity	Required	Available/(Deficit)	Capacity/ERU	# Add. ERUs
Retail Only					
Existing (2017)	14,250	2,034	12,216	0.913	13,380
5-Year (2022)	14,250	2,138	12,112	0.913	13,266
20-Year (2027)	14,250	2,482	11,768	0.913	12,890
Vested Conn. (2065)	14,250	3,253	10,997	0.913	12,045
Retail and Wholesale					
Existing (2017)	14,250	7,768	6,482	0.913	7,100
5-Year (2022)	14,250	8,164	6,086	0.913	6,666
20-Year (2027)	14,250	9,478	4,772	0.913	5,227
Vested Conn. (2065)	14,250	12,497	1,753	0.913	1,920
Total Capacity (gal)	Existing Capacity	Required	Available/(Deficit)	Capacity/ERU	# Add. ERUs
Retail Only					
Existing (2017)	17,116,000	3,108,937	14,007,063	1,395	10,041
5-Year (2022)	17,116,000	3,258,342	13,857,658	1,395	9,934
20-Year (2027)	17,116,000	3,753,860	13,362,140	1,395	9,579
Vested Conn. (2065)	17,116,000	4,864,322	12,251,678	1,395	8,783
Retail and Wholesale					
Existing (2017)	17,116,000	11,365,355	5,750,645	1,395	4,122
5-Year (2022)	17,116,000	11,935,920	5,180,080	1,395	3,713
20-Year (2027)	17,116,000	13,828,258	3,287,742	1,395	2,357
Vested Conn. (2065)	17,116,000	18,175,534	(1,059,534)	1,395	0
Storage Capacity (gal)	Existing Capacity	Required	Available/(Deficit)	Capacity/ERU	# Add. ERUs
Existing (2017)	2,500,000	3,108,937	(608,937)	1,314	0
5-Year (2022)	2,500,000	3,258,342	(758,342)	1,314	0
20-Year (2027)	2,500,000	3,753,860	(1,253,860)	1,314	0
Vested Conn. (2065)	2,500,000	4,864,322	(2,364,322)	1,314	0
Storage Capacity w/Reserve (gal)	Existing Capacity	Required	Available/(Deficit)	Capacity/ERU	# Add. ERUs
Existing (2017)	2,500,000	4,573,406	(2,073,406)	1,971	0
5-Year (2022)	2,500,000	4,797,514	(2,297,514)	1,971	0
20-Year (2027)	2,500,000	5,540,790	(3,040,790)	1,971	0
Vested Conn. (2065)	2,500,000	7,206,483	(4,706,483)	1,971	0
Treatment					
Retail water is currently not being chlorinated.					
Distribution System (gpm)	Maxmum Day Demand	Peak Hour Demand	Maximum Day w/ Fireflow		
Existing (2017)	2,034	4,061	3,534		
5-Year (2022)	2,138	4,268	3,638		
20-Year (2027)	2,482	4,955	3,982		
Vested Conn. (2065)	3,253	6,495	4,753		

8.2 Opinions of Probable Cost

Opinions of Probable Cost for the recommended improvements have been prepared and are included in Appendix B.

Opinions of probable cost for each of the capital projects are based on experience with similar projects, bid tabulations from past projects, and from information provided by the Town through prior experience.

Estimated project costs for pipeline projects are given as a cost per linear foot of pipe as illustrated in Figure 8-1.

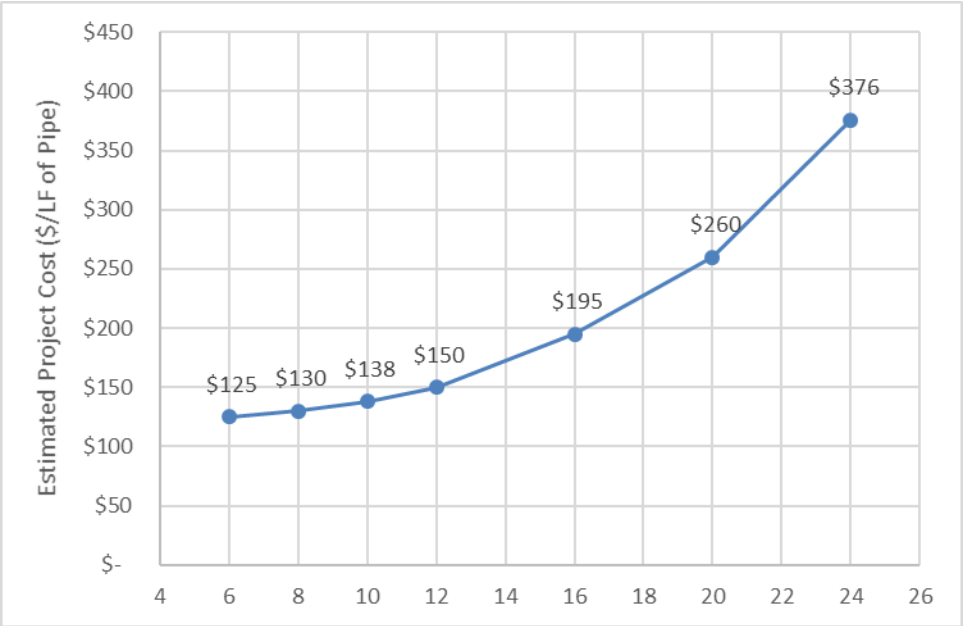


Figure 8-1: Project Cost vs. Pipe Diameter

Estimated pipeline project costs per linear foot are intended to include costs normally appurtenant to the project such as mobilization, materials sampling and testing, valves, fittings, service connections, earth materials, vaults, asphalt replacement, surface restoration, etc. as well as professional and incidental costs such as environmental services, right-of-way acquisition, funding administration, survey, permitting, geotechnical reports, legal services, engineering services, etc.

Opinions of probable costs for non-pipeline improvements are intended to include the primary improvement listed, plus costs for appurtenances typical of a similar improvement, plus incidental and professional costs as described previously.

Opinions of probable project costs included in this report are planning-level costs only. As the Town seeks to undertake specific projects, more detailed, project-specific opinions of cost should

be prepared to guide project development through the preliminary engineering and funding acquisition phases.

8.3 Capital Improvements Projects and Priorities

Table 8-1 below summarizes the cost totals for each category. These totals correspond with the totals shown on the Engineer's Opinion of Probable Cost shown in Appendix B. The projects have been prioritized based on perceived project need. Projects should be re-prioritized each year based on available budget and a change in priorities. For example, replacing asbestos cement pipe is shown throughout the 20-year planning horizon; however, these improvements may need to be completed at the beginning of the planning horizon as the asbestos cement pipe nears its design life.

Table 8-1: Capital Projects Summary

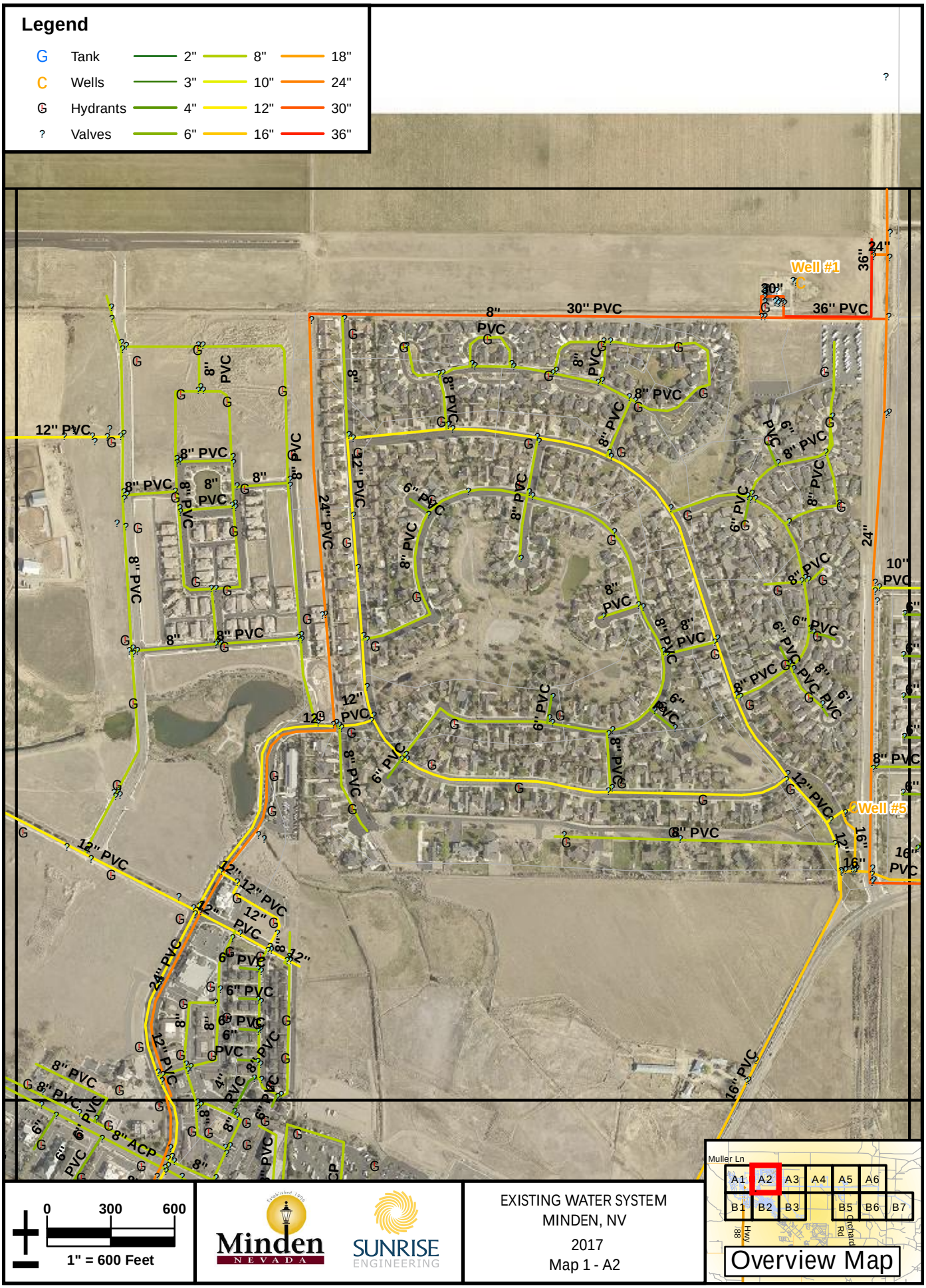
5-YEAR PROJECTS		
Project	**Est. Cost**	**Est. Completion**
Portable Generator	$ 115,000	2018
Replace Pipes Installed Prior to 1960	$ 561,000	2017-2019
Install Meter, Meter Pit, and Radio Read Equipment	$ 335,000	2017-2021
Fire Flow Improvements	$ 102,000	2027
TOTAL 5-YEAR PROJECT COST	$ 1,113,000	
20-YEAR PROJECTS		
Project	**Est. Cost**	**Est. Completion**
Backup Power Generation	$ 276,000	2023
Replace All Asbestos Cement Pipe	$ 6,850,000	2022-2037
Install Meter, Meter Pit, and Radio Read Equipment	$ 162,000	2022-2025
New Hydrant and Associated Improvements	$ 66,000	2026
TOTAL 20-YEAR PROJECT COST	$ 7,354,000	

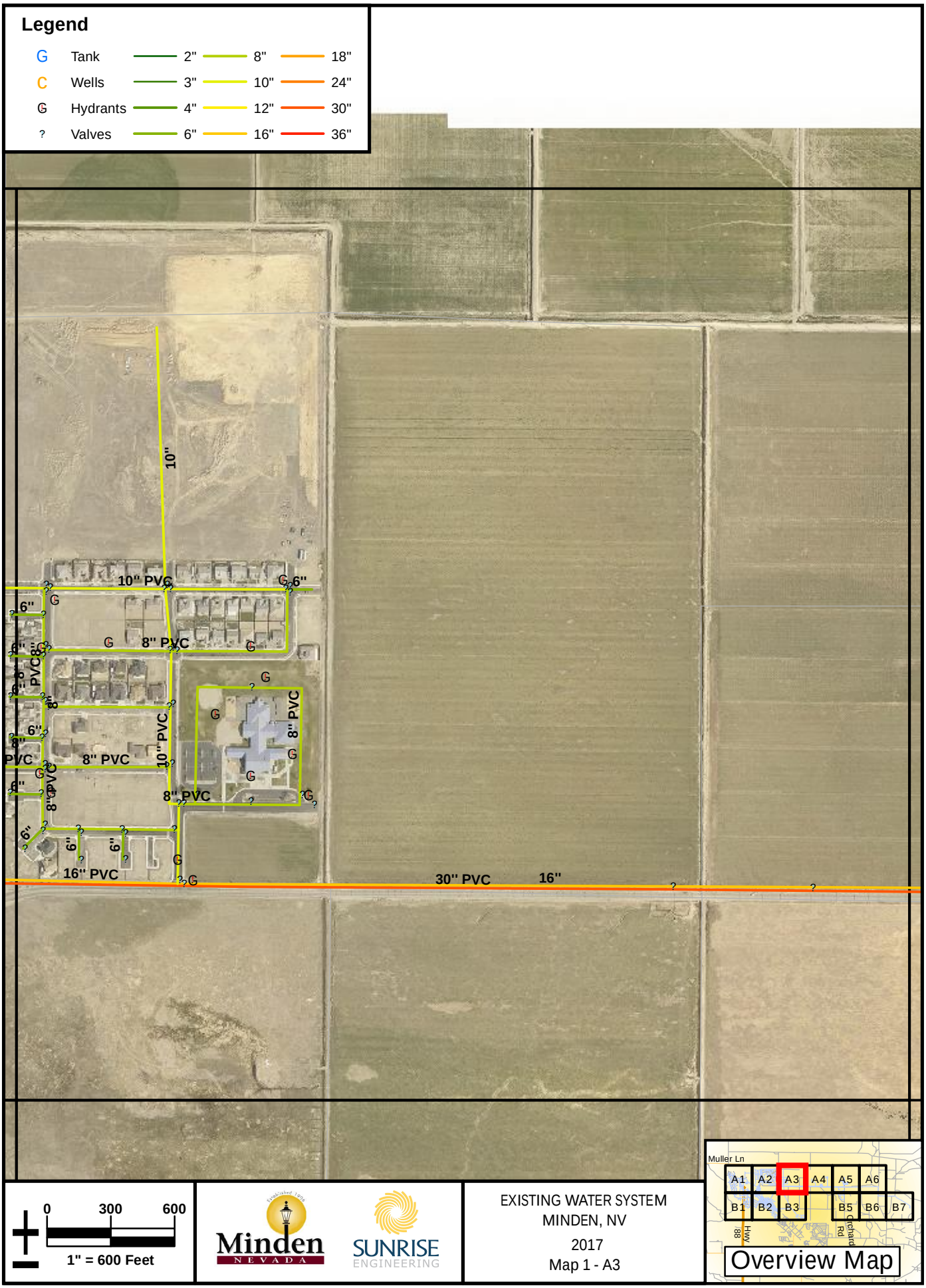
The scope of this analysis does not include an analysis of the financial information of the Town of Minden to ensure proper funding exists for each of these projects.

APPENDIX A

MAPS


Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #4
6" PVC
6" ACP
4" PVC
8" ACP
10" ACP
12" ACP
12" PVC
8" PVC
10" PVC
6" PVC
4" PVC
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - A1
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

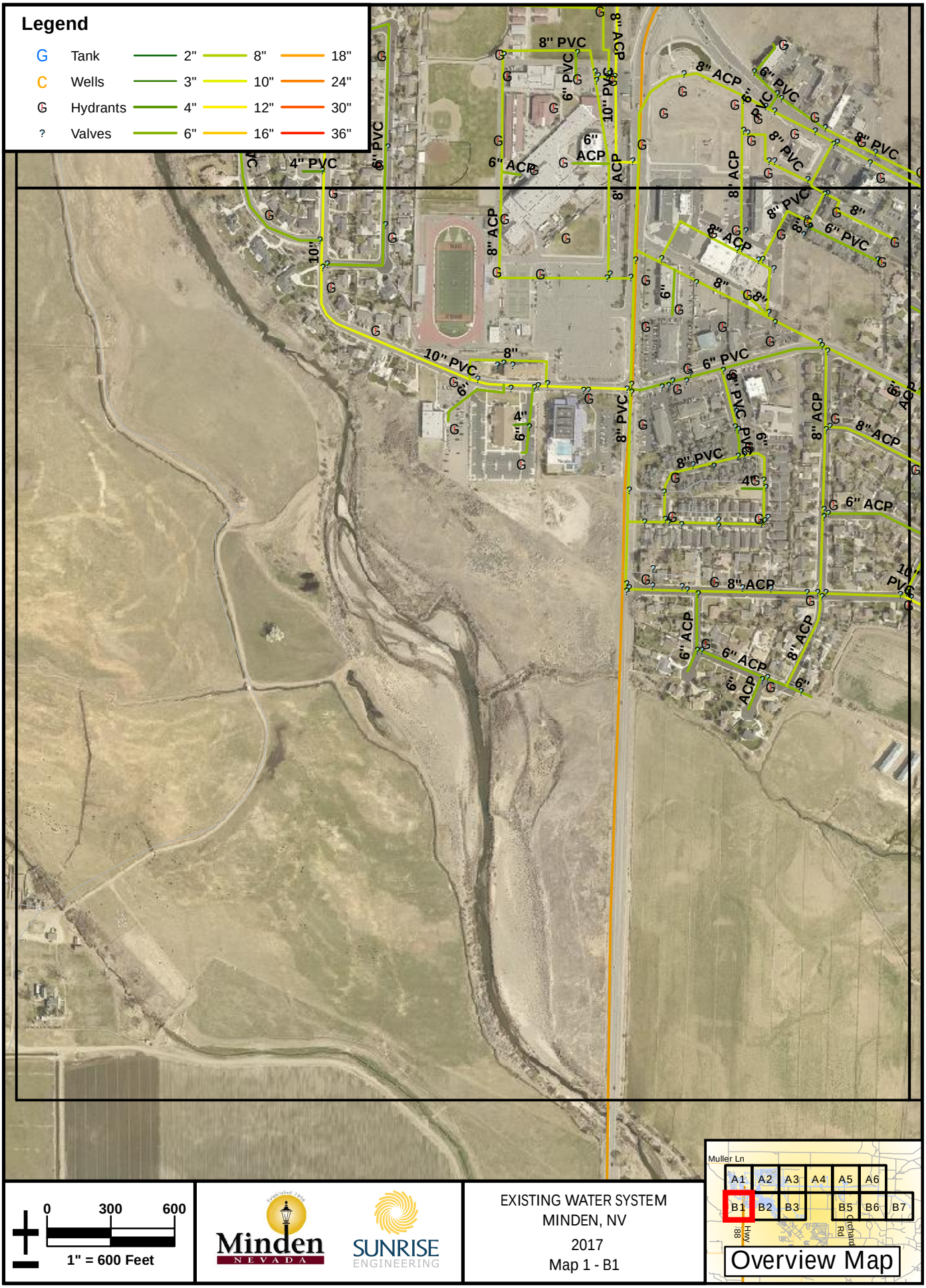

Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #1
Well #5
30" PVC
36" PVC
12" PVC
24" PVC
16" PVC
8" PVC
6" PVC
8" ACP
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - A2
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
10"
10" PVC
6"
8" PVC
10" PVC
8" PVC
8" PVC
8" PVC
8" PVC
6"
6"
6"
6"
16" PVC
30" PVC
16"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - A3
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
8" PVC
6"
6"
12" PVC
10" PVC
30"
16"
2"
24"
6"
16"
30" PVC
16" PVC
Well #8
16" PVC
30" PVC
12" PVC
6"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - A4
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #6
Well #7
10" PVC
8" PVC
6" PVC
12" PVC
16" PVC
30" PVC
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - A5
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
G Tank
C Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
30" PVC
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - A6
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
8" PVC
8" ACP
6" PVC
6" ACP
10" PVC
4" PVC
10" ACP
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - B1
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #2
Well #3
Well #9
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - B2
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
12" PVC
10"
4" ACP
8" PVC
8" PVC
12" PVC
12"
12" PVC
8" PVC
8" PVC
8" PVC
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - B3
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

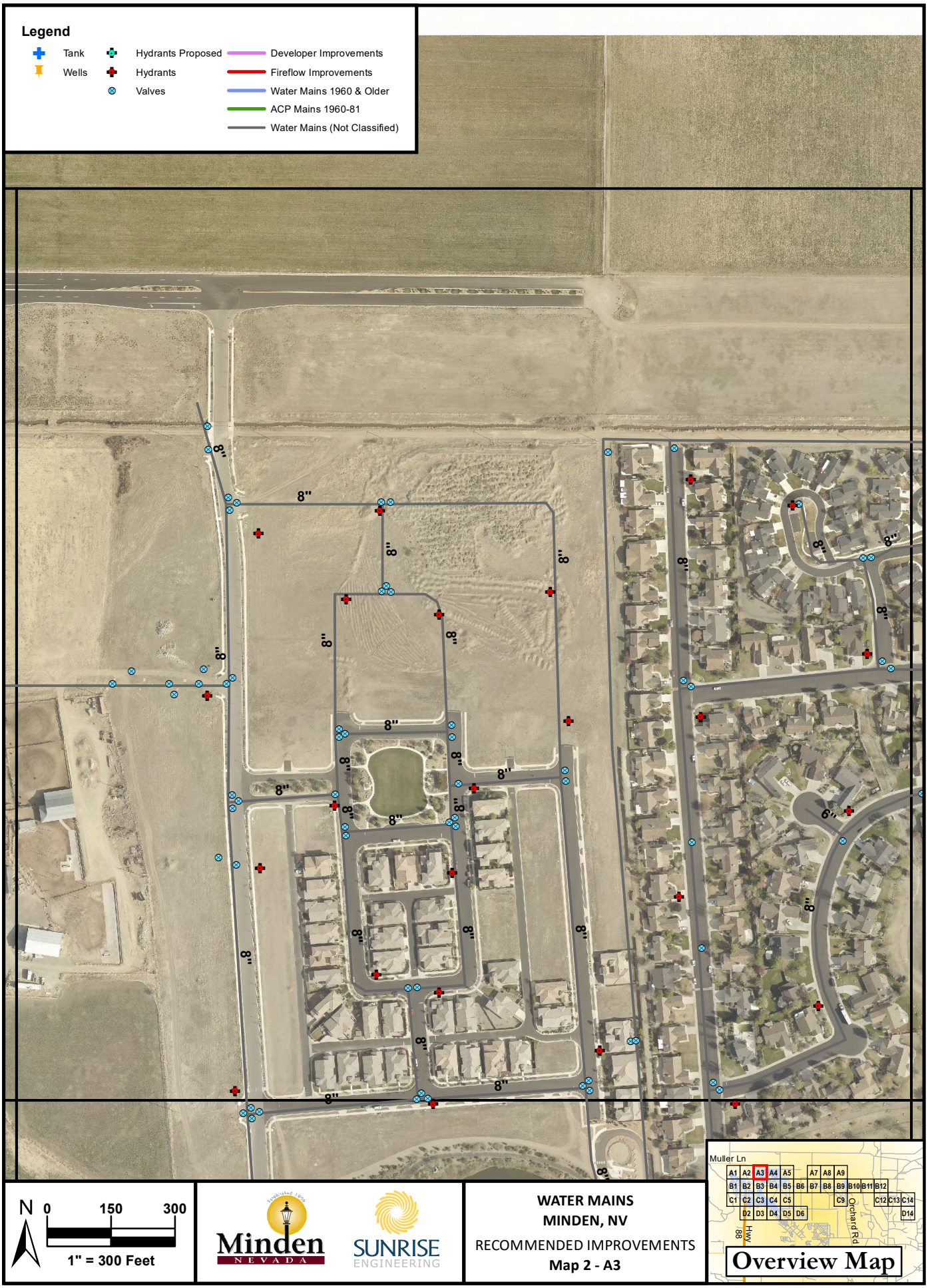

Legend
Tank
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
12" PVC
8" PVC
12" PVC
12" PVC
8" PVC
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - B5
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
G Tank
C Wells
Hydrants
? Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
30" PVC
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - B6
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

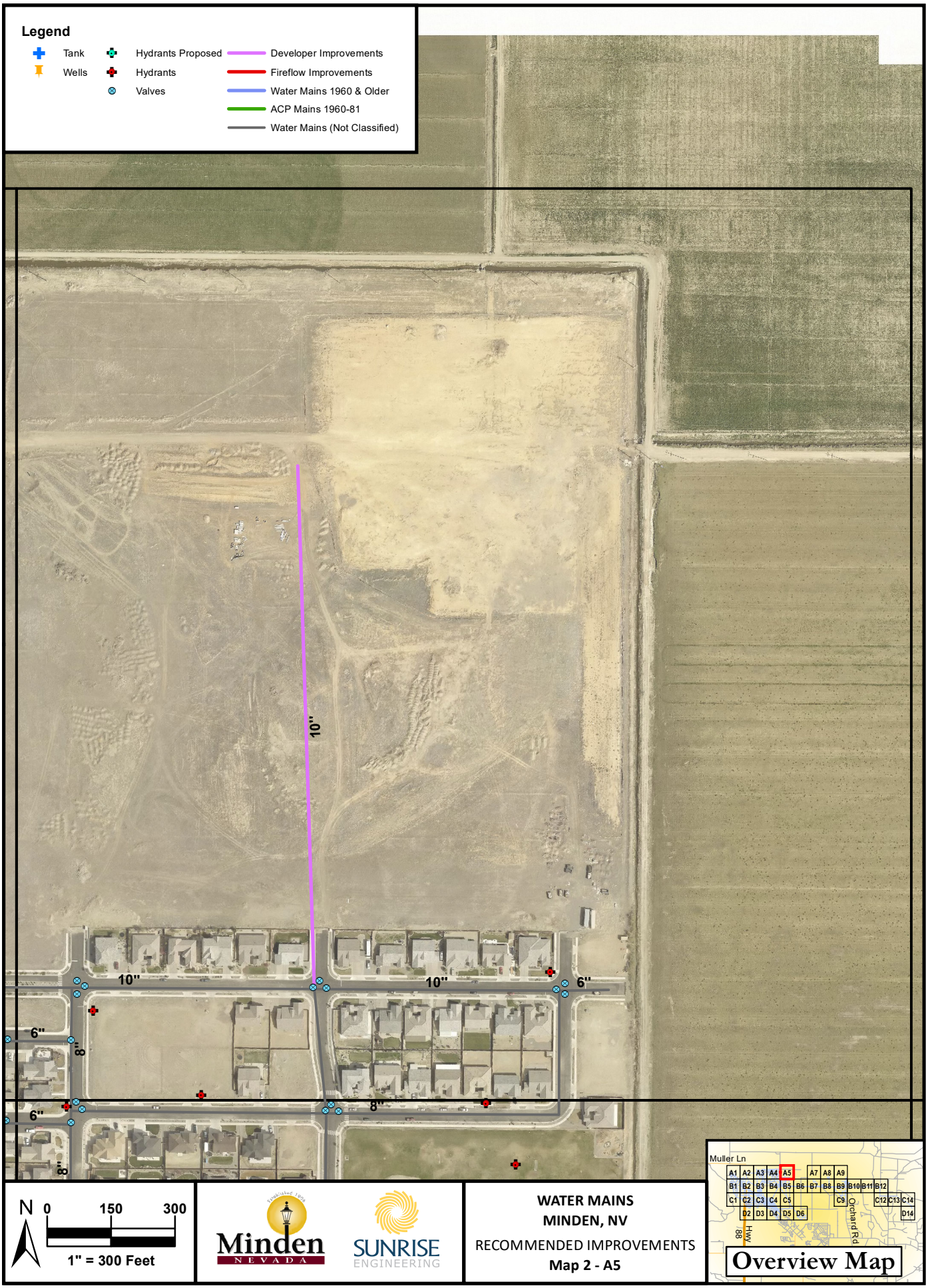

Legend
G Tank
C Wells
Hydrants
? Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
30" PVC
24"x36"
ExistingTank G
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
EXISTING WATER SYSTEM
MINDEN, NV
2017
Map 1 - B7
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
6"
4"
12"
1
2
3
Well #4
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - A1
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
12"
12"
12"
12"
12"
6"
6"
6"
6"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - A2
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
8"
6"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - A3
Muller Ln
Hwy 88
Orchard Rd
A1 A2 A3 A4 A5 A7 A8 A9
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
C1 C2 C3 C4 C5 C9 C12 C13 C14
D2 D3 D4 D5 D6 D14
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
Well #1
30"
36"
24"
12"
8"
6"
4
5
6
7
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - A4
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
10"
10"
10"
6"
6"
8"
6"
8"
8"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
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MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - A5
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - A7
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - A8
Muller Ln
Hwy 88
Orchard Rd
Overview Map

N 0 150 300

1" = 300 Feet

Minden NEVADA

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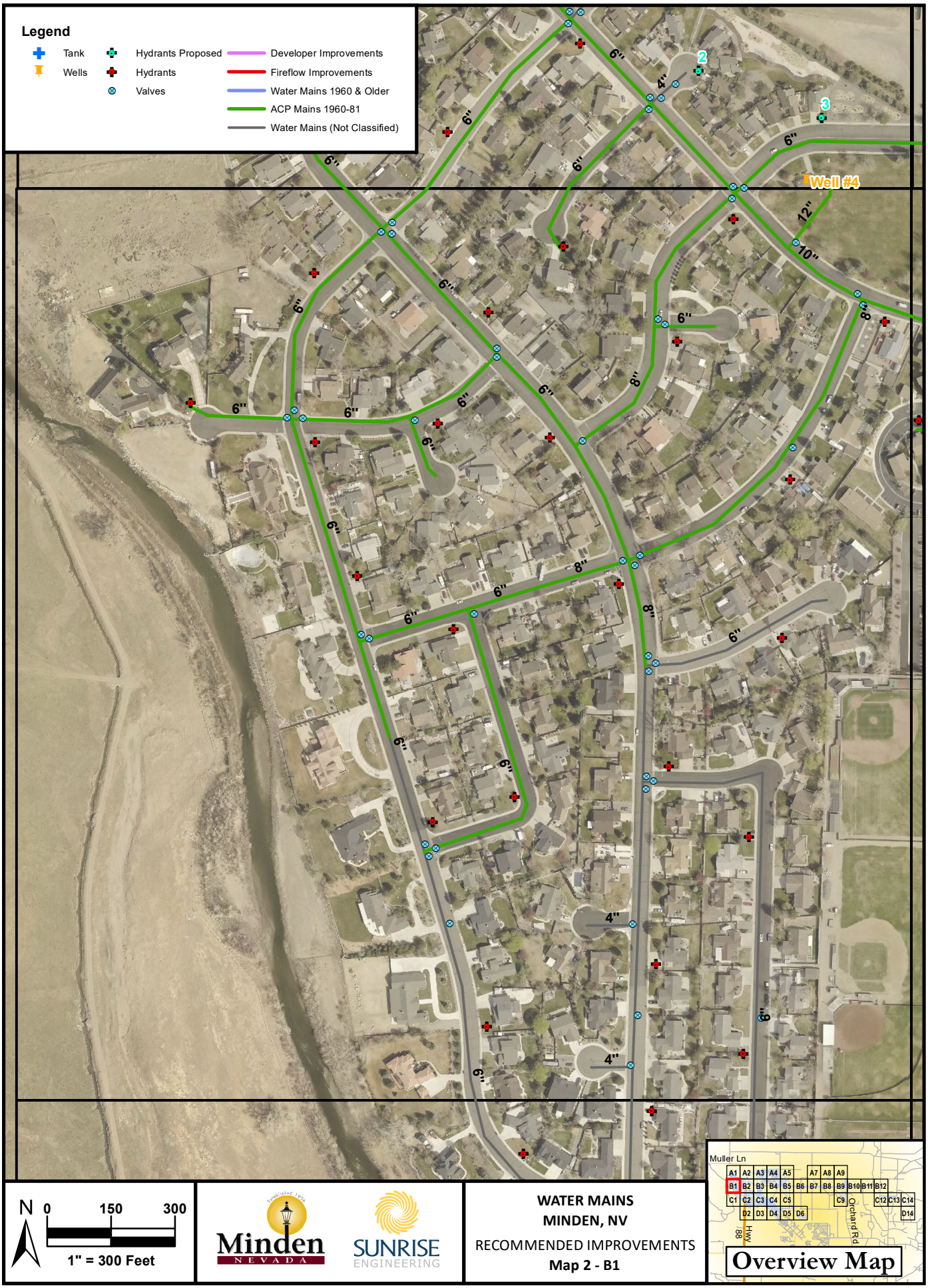
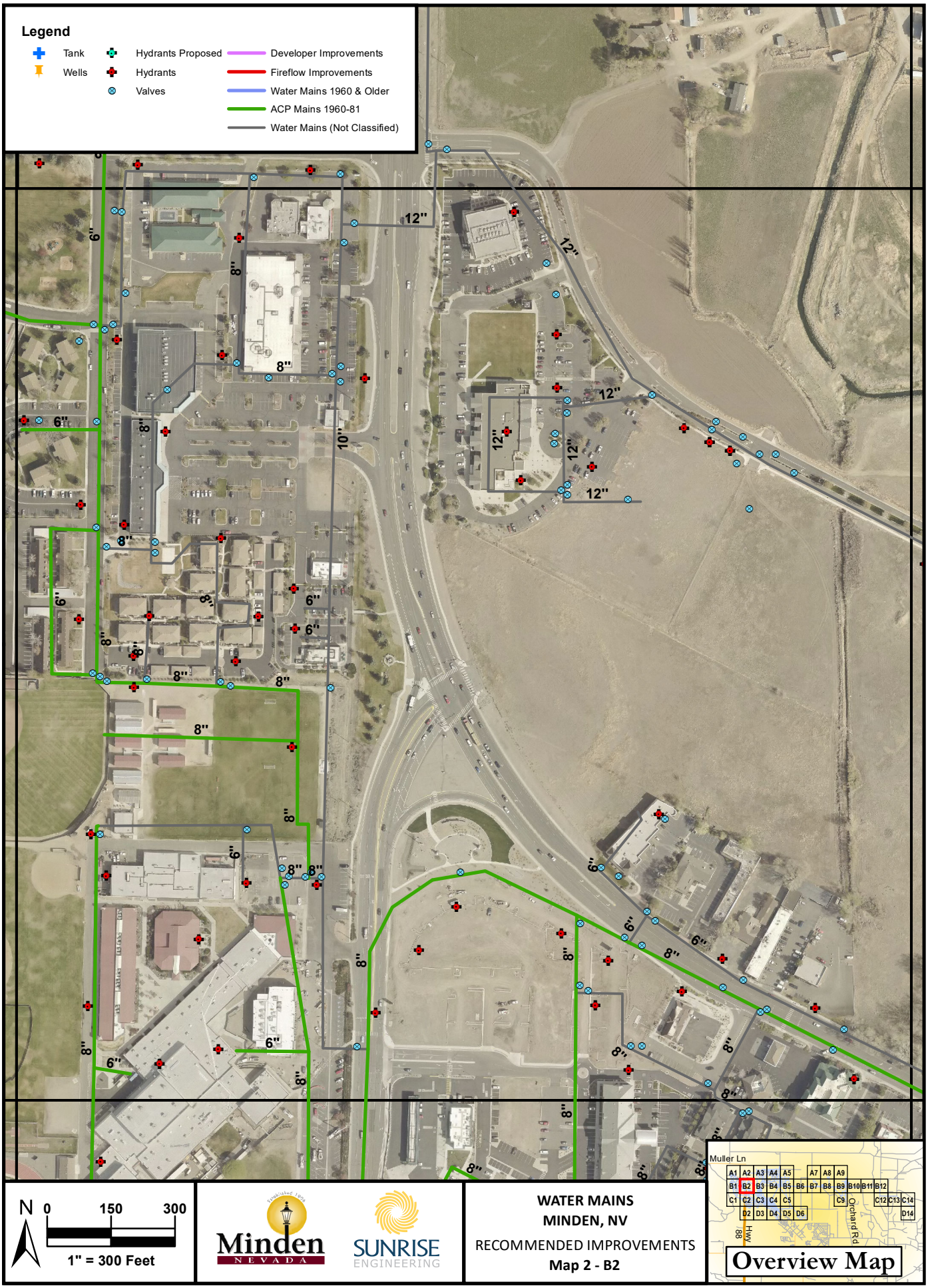
WATER MAINS
MINDEN, NV

RECOMMENDED IMPROVEMENTS

Map 2 - A9


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
Well #4
2
3
6"
4"
8"
12"
10"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B1
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
12"
10"
8"
6"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B2
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B3
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
Well #5
24"
8"
6"
12"
16"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B4
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
10"
6"
8"
6"
8"
8"
6"
8"
10"
8"
6"
8"
8"
6"
6"
6"
8"
8"
8"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B5
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
30"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B6
Muller Ln
A1 A2 A3 A4 A5 A7 A8 A9
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
C1 C2 C3 C4 C5 C9 C12 C13 C14
D2 D3 D4 D5 D6 D14
Orchard Rd
Hwy 88
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
6"
6"
12"
16"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B7
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
8"
10"
18"
12"
18"
18"
4"
16"
30"
24"
6"
Well #8
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B8
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
Well #6
Well #7
6"
8"
10"
12"
16"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B9
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
6"
10"
6"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B10
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B11
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
30"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - B12
Muller Ln
A1 A2 A3 A4 A5 A7 A8 A9
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
C1 C2 C3 C4 C5 C9 C12 C13 C14
D2 D3 D4 D5 D6 D14
Orchard Rd
Hwy 88
Overview Map

N 0 150 300

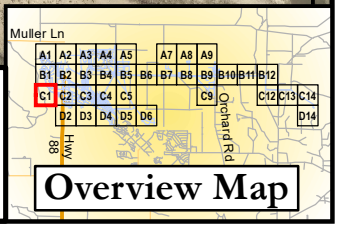
1" = 300 Feet

Minden NEVADA

SUNRISE ENGINEERING

WATER MAINS
MINDEN, NV

RECOMMENDED IMPROVEMENTS
Map 2 - C1




Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - C2
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
Well #3
8
9
10
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - C3
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
Well #9
Well #2
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - C4
Overview Map
Muller Ln
Orchard Rd
Hwy 88

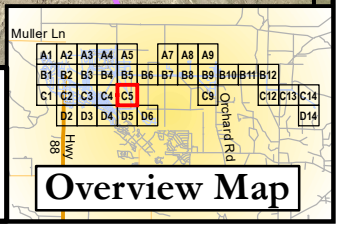
N 0 150 300

1" = 300 Feet

Minden NEVADA

SUNRISE ENGINEERING

WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - C5




Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
8"
12"
12"
12"
8"
12"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - C9
Muller Ln
A1 A2 A3 A4 A5 A7 A8 A9
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
C1 C2 C3 C4 C5 C9 C12 C13 C14
D2 D3 D4 D5 D6 D14
Orchard Rd
Hwy 88
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - C12
Muller Ln
Hwy 88
Orchard Rd
Overview Map

N 0 150 300

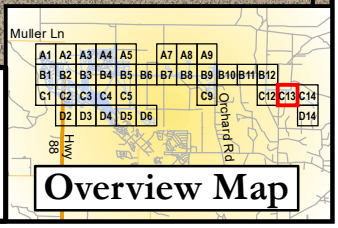
1" = 300 Feet

Minden NEVADA

SUNRISE ENGINEERING

WATER MAINS
MINDEN, NV

RECOMMENDED IMPROVEMENTS
Map 2 - C13




Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - C14
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
8"
8"
6"
6"
8"
6"
6"
6"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - D2
Muller Ln
A1 A2 A3 A4 A5 A7 A8 A9
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
C1 C2 C3 C4 C5 C9 C12 C13 C14
D2 D3 D4 D5 D6 D14
Hwy 88
Orchard Rd
Overview Map

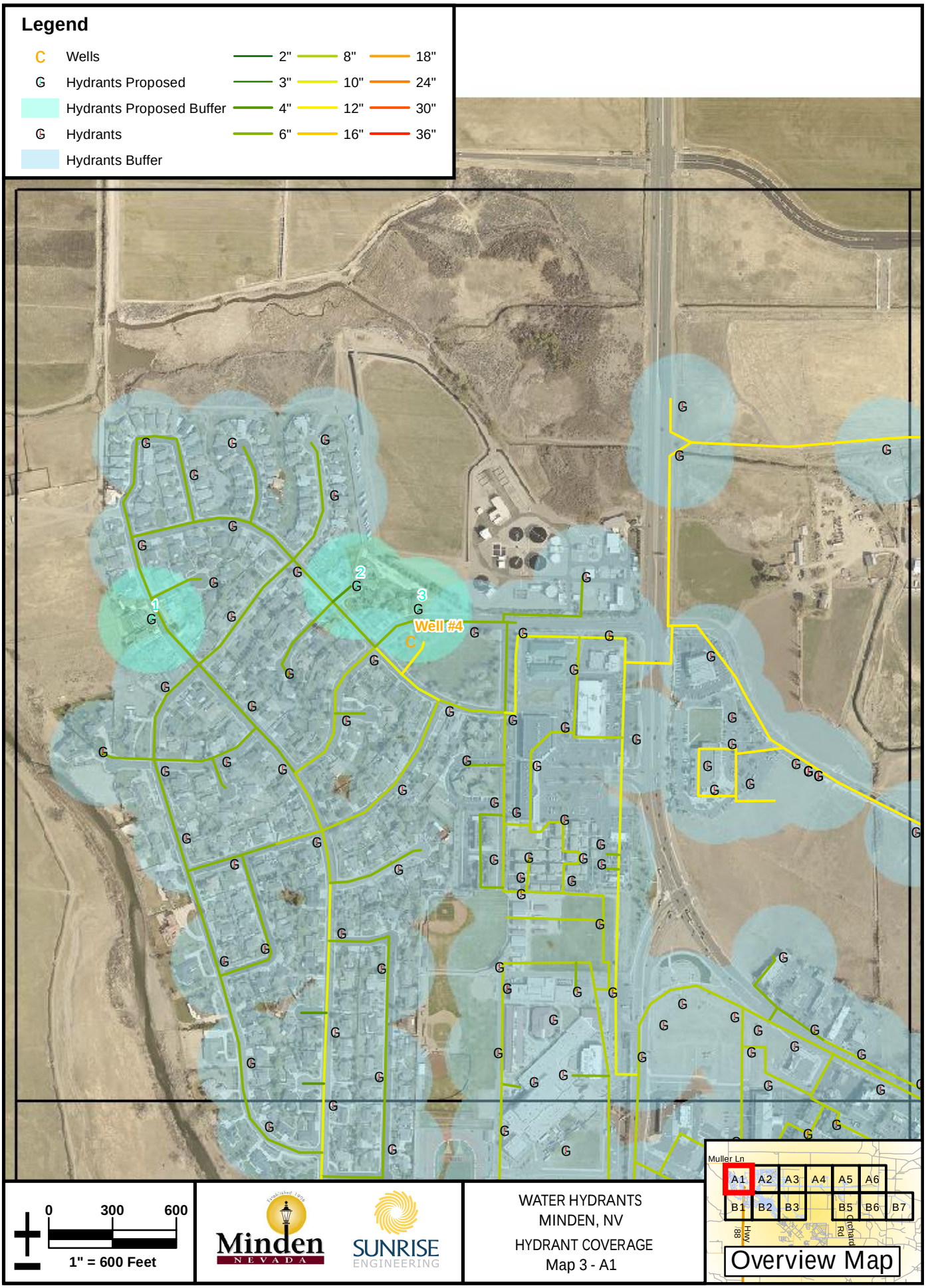

Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
10"
6"
4"
10
6"
6"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - D3
Muller Ln
Hwy 88
Orchard Rd
Overview Map

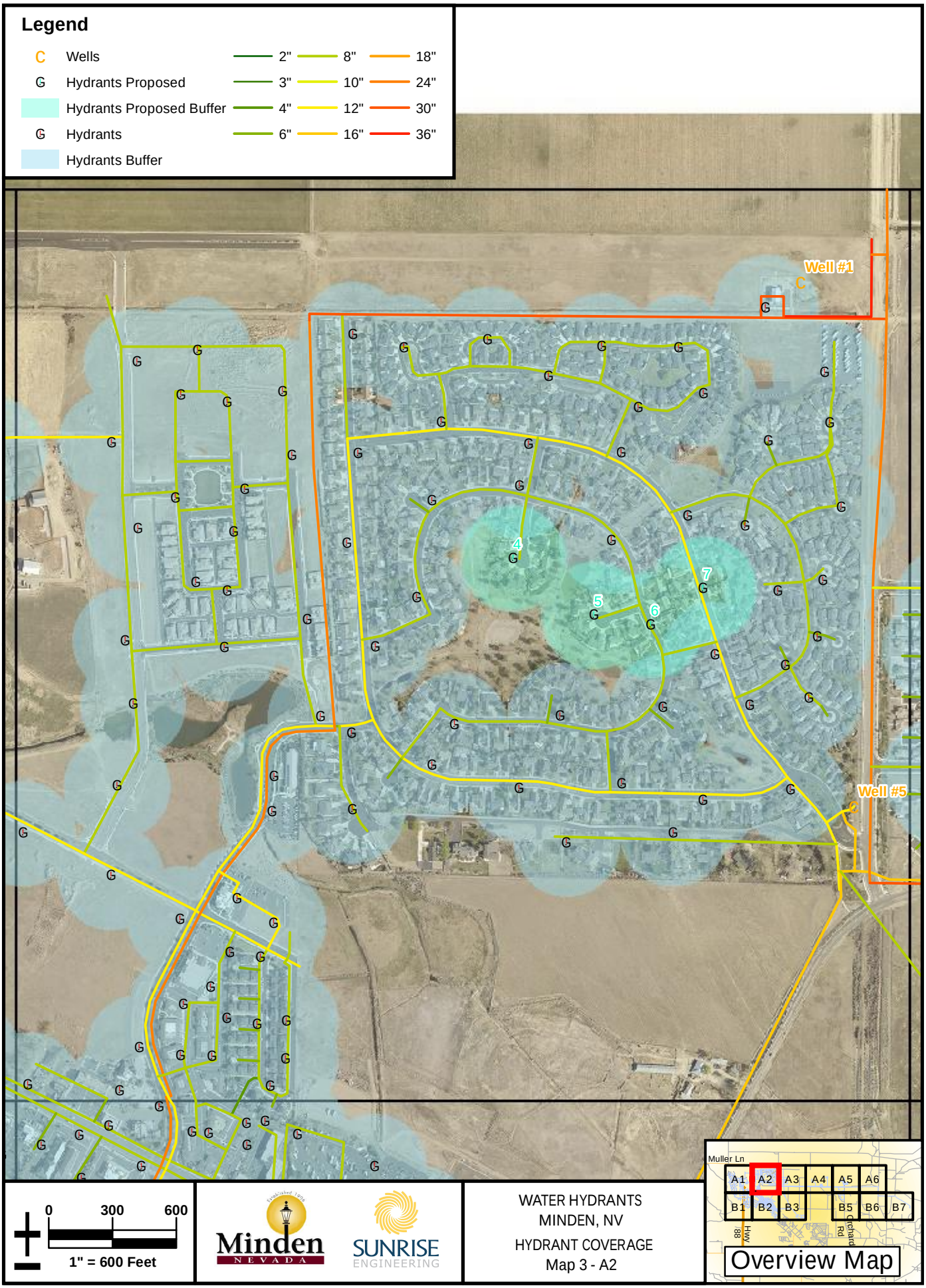

Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
Well #2
11
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - D4
Muller Ln
Orchard Rd
Hwy 88
Overview Map

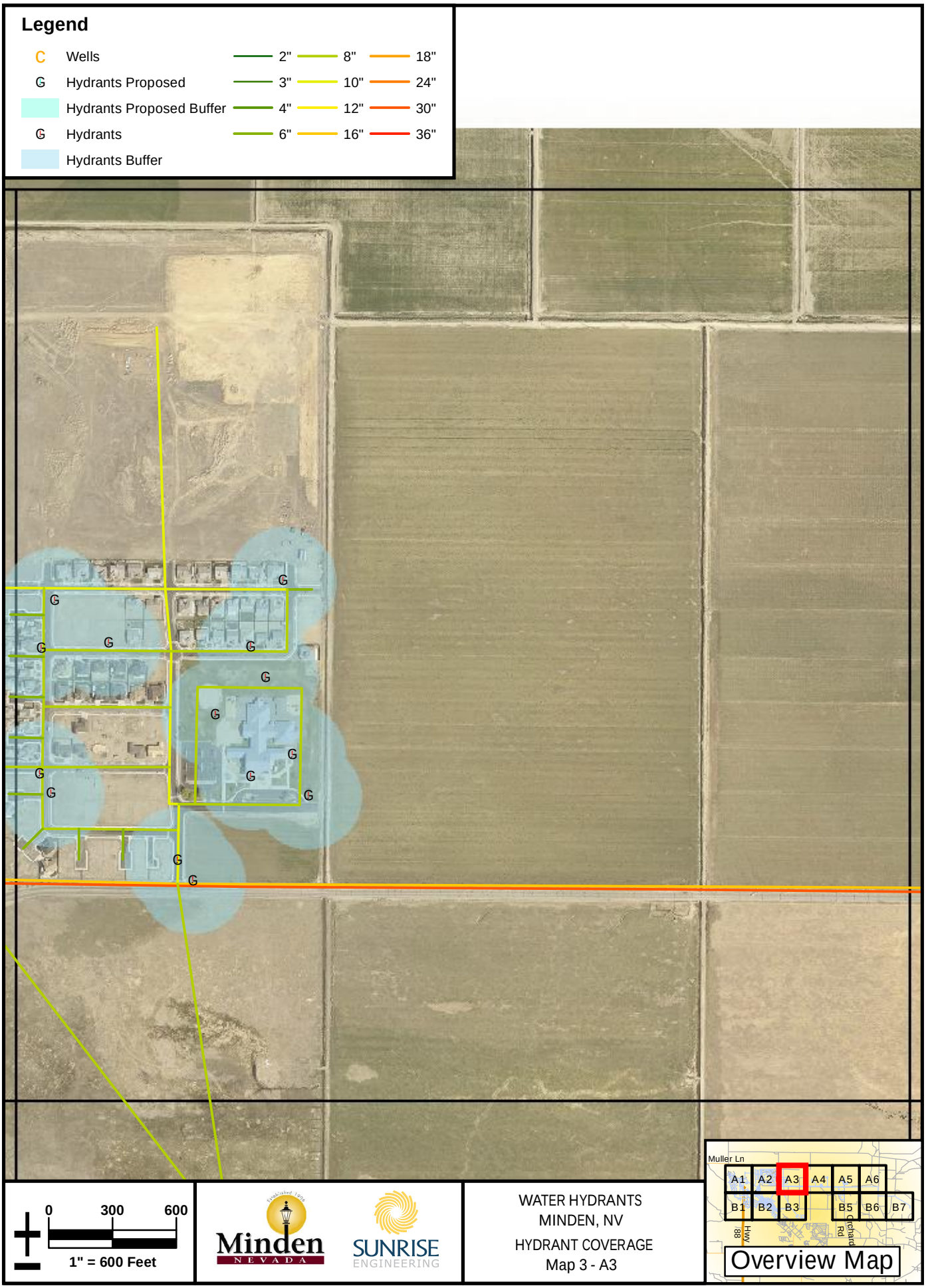

Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
12"
10"
8"
8"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - D5
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
8"
8"
8"
8"
12"
12"
8"
8"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - D6
Muller Ln
Hwy 88
Orchard Rd
A1 A2 A3 A4 A5 A7 A8 A9
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
C1 C2 C3 C4 C5 C9 C12 C13 C14
D2 D3 D4 D5 D6 D14
Overview Map

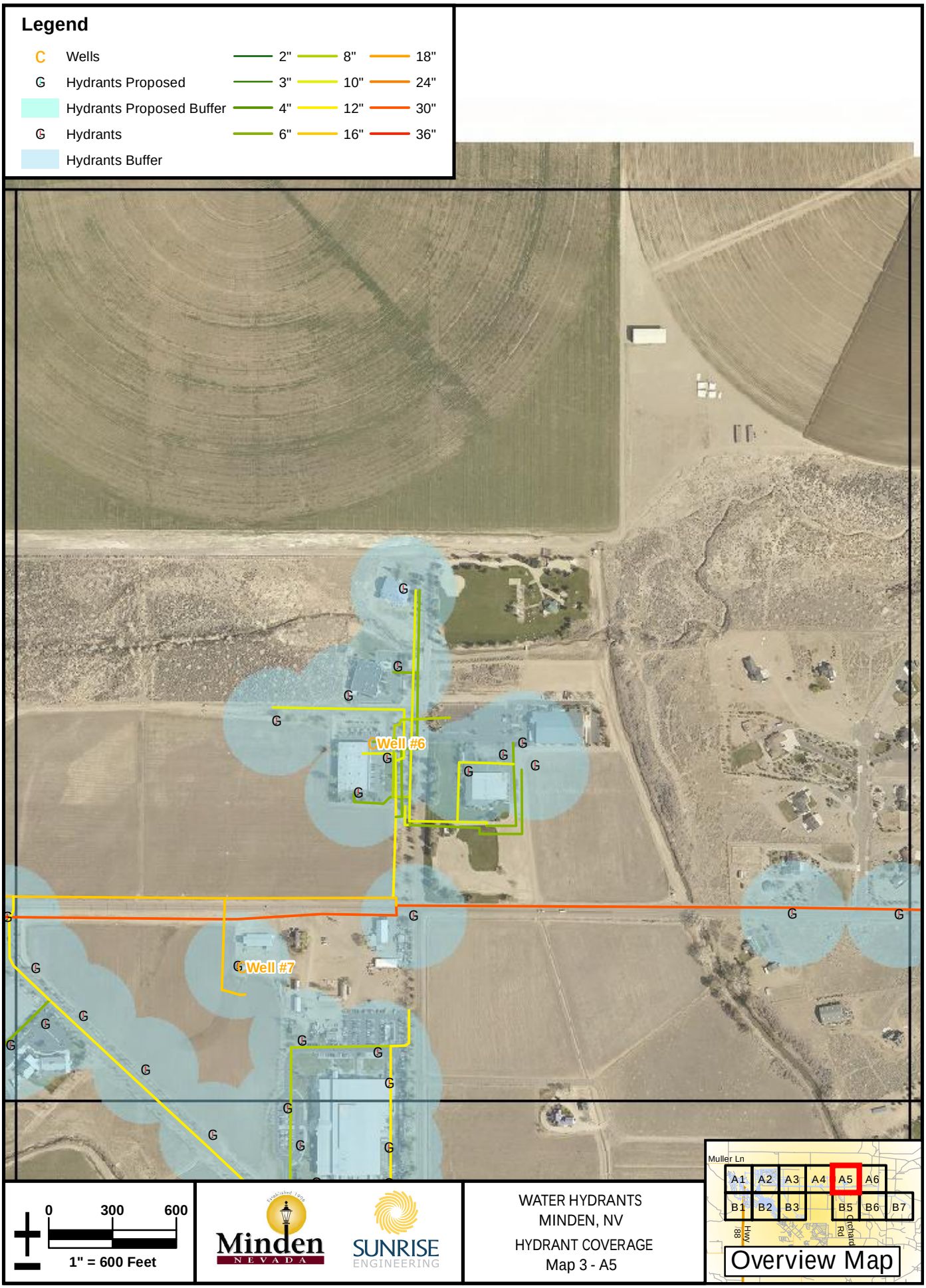

Legend
Tank
Wells
Hydrants Proposed
Hydrants
Valves
Developer Improvements
Fireflow Improvements
Water Mains 1960 & Older
ACP Mains 1960-81
Water Mains (Not Classified)
24"
36"
N
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
RECOMMENDED IMPROVEMENTS
Map 2 - D14
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #4
1
2
3
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - A1
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

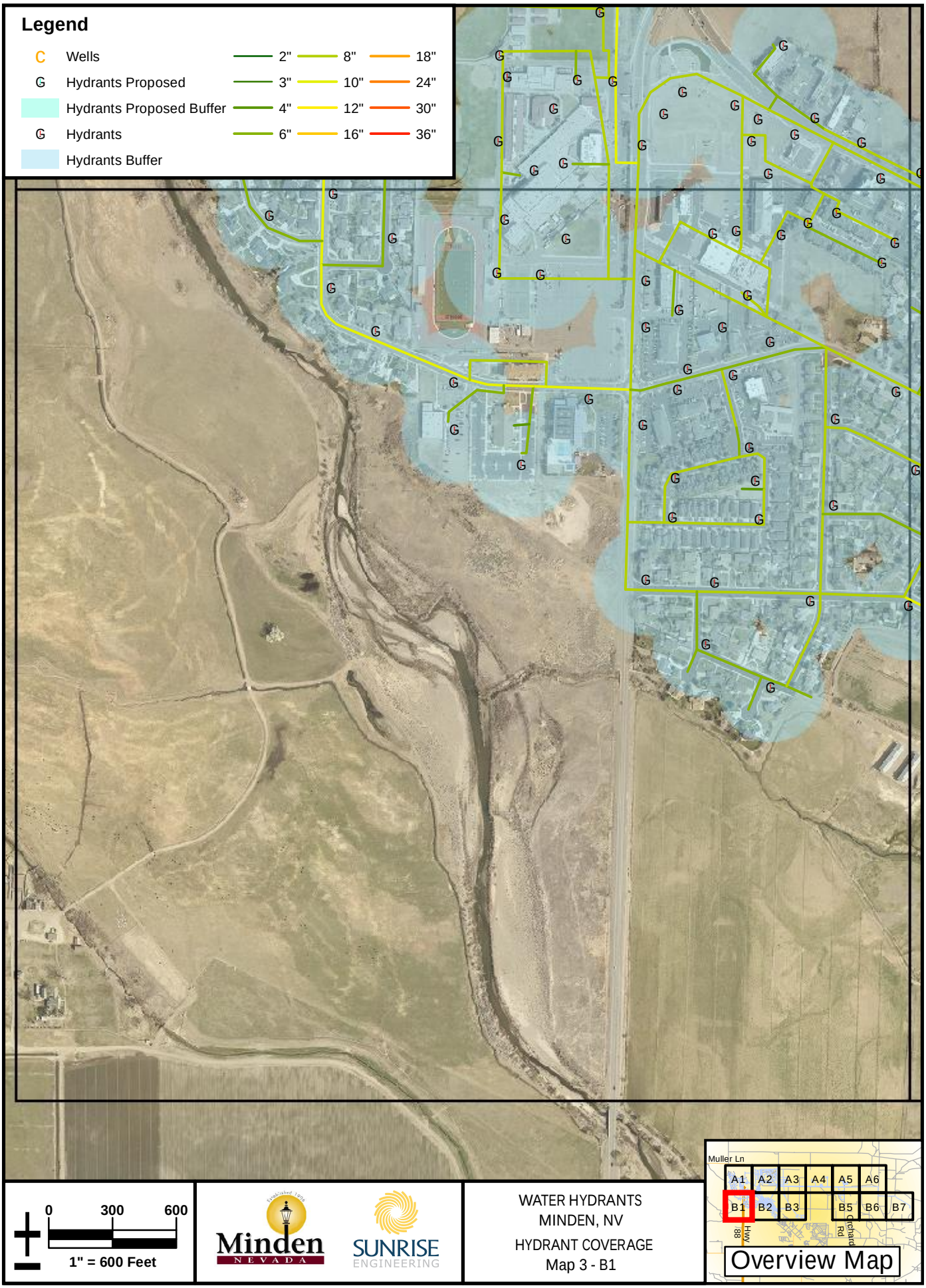

Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #1
Well #5
4
5
6
7
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - A2
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

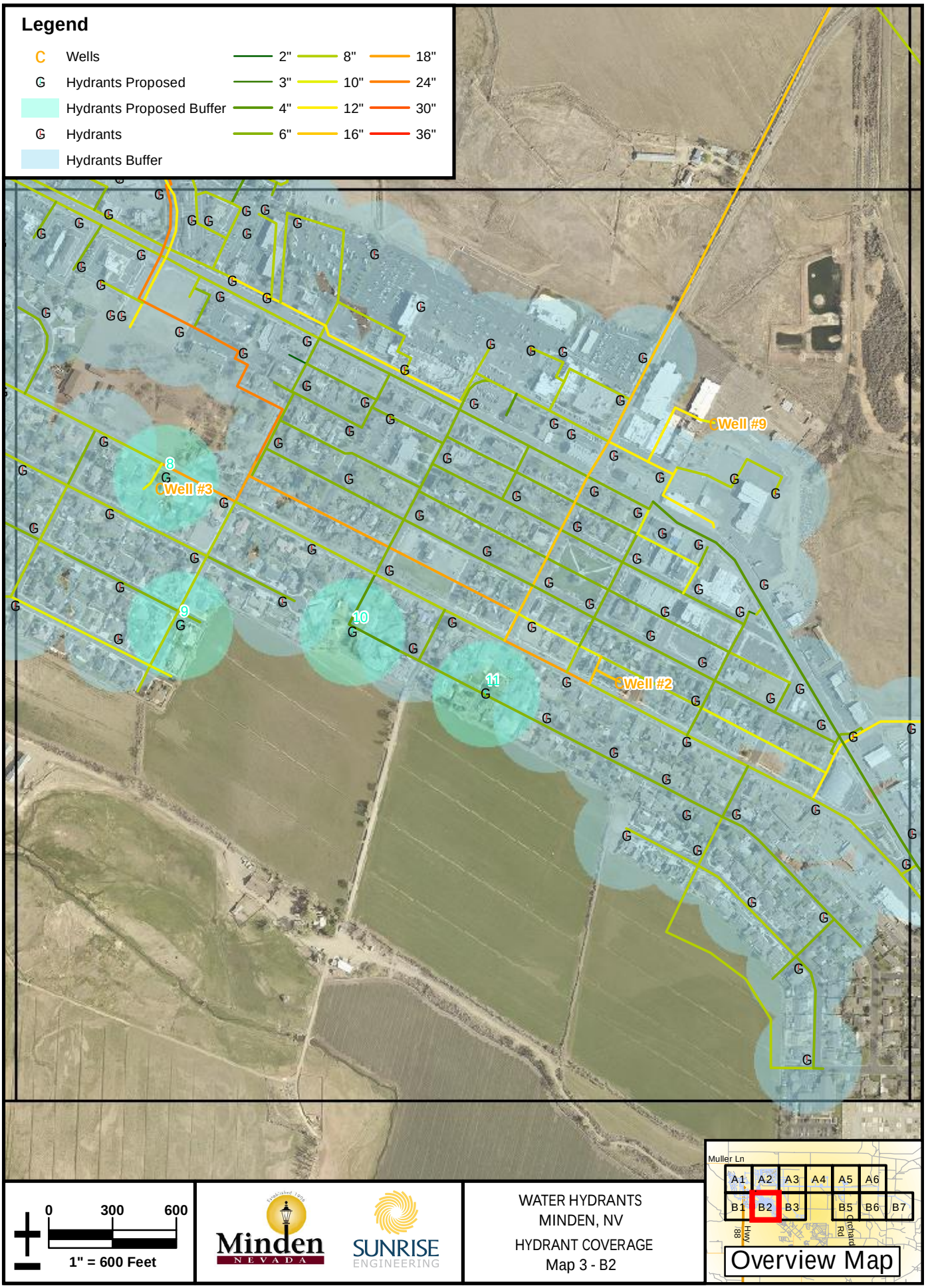

Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - A3
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #8
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - A4
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #6
Well #7
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - A5
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - A6
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
C Wells
G Hydrants Proposed
Hydrants Proposed Buffer
G Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - B1
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #9
Well #3
Well #2
8
9
10
11
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - B2
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

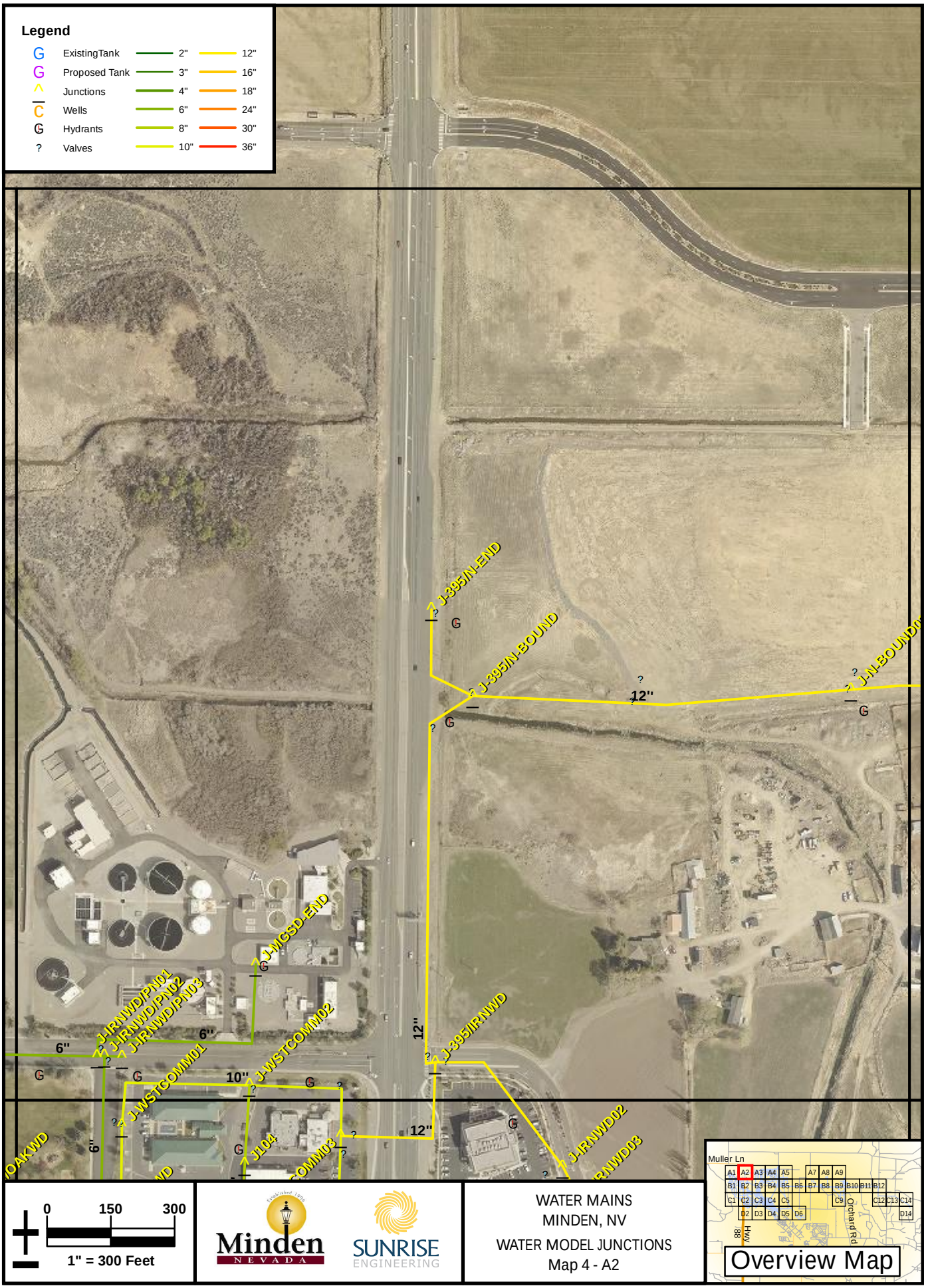

Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - B3
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

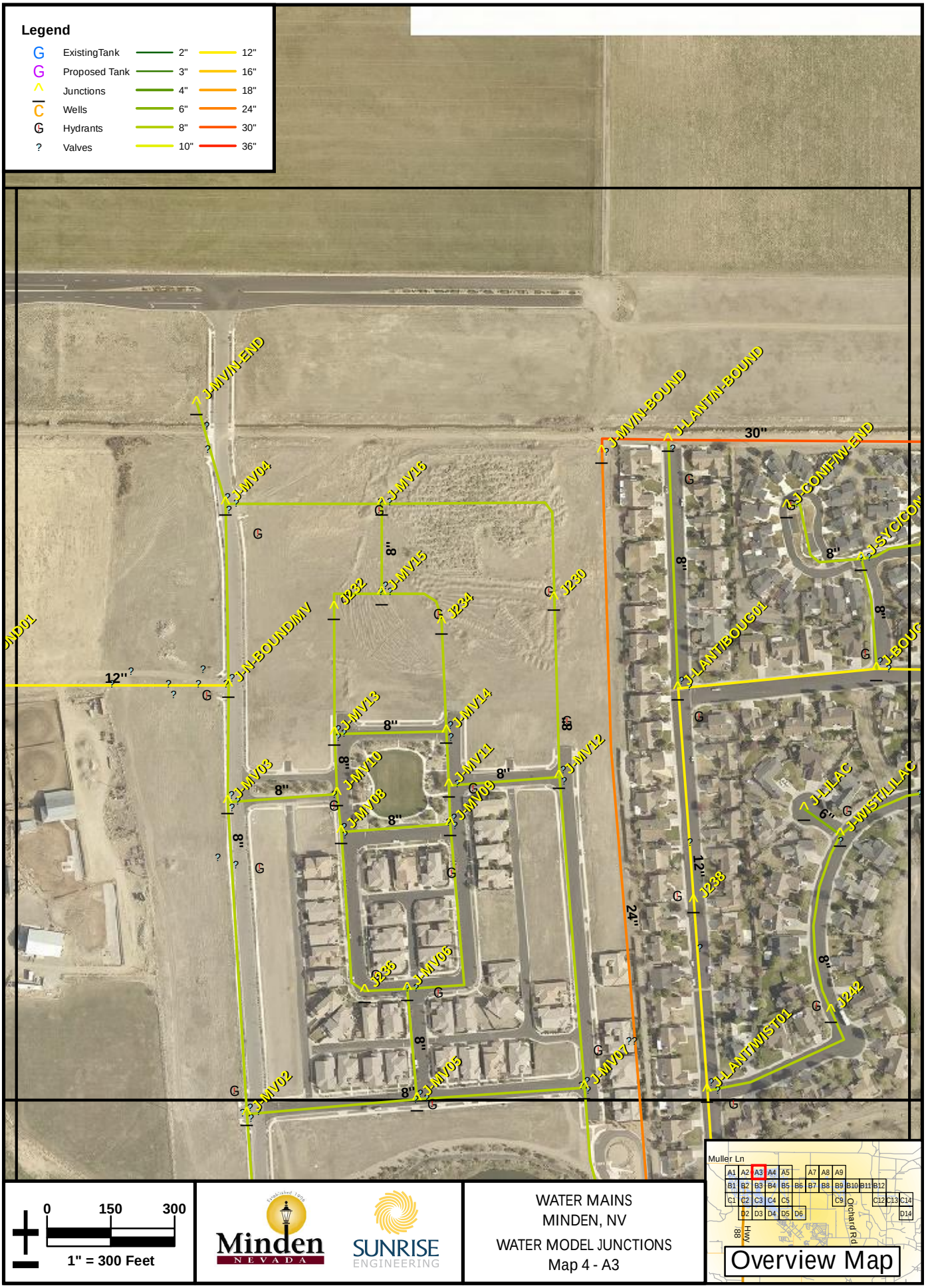

Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - B5
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

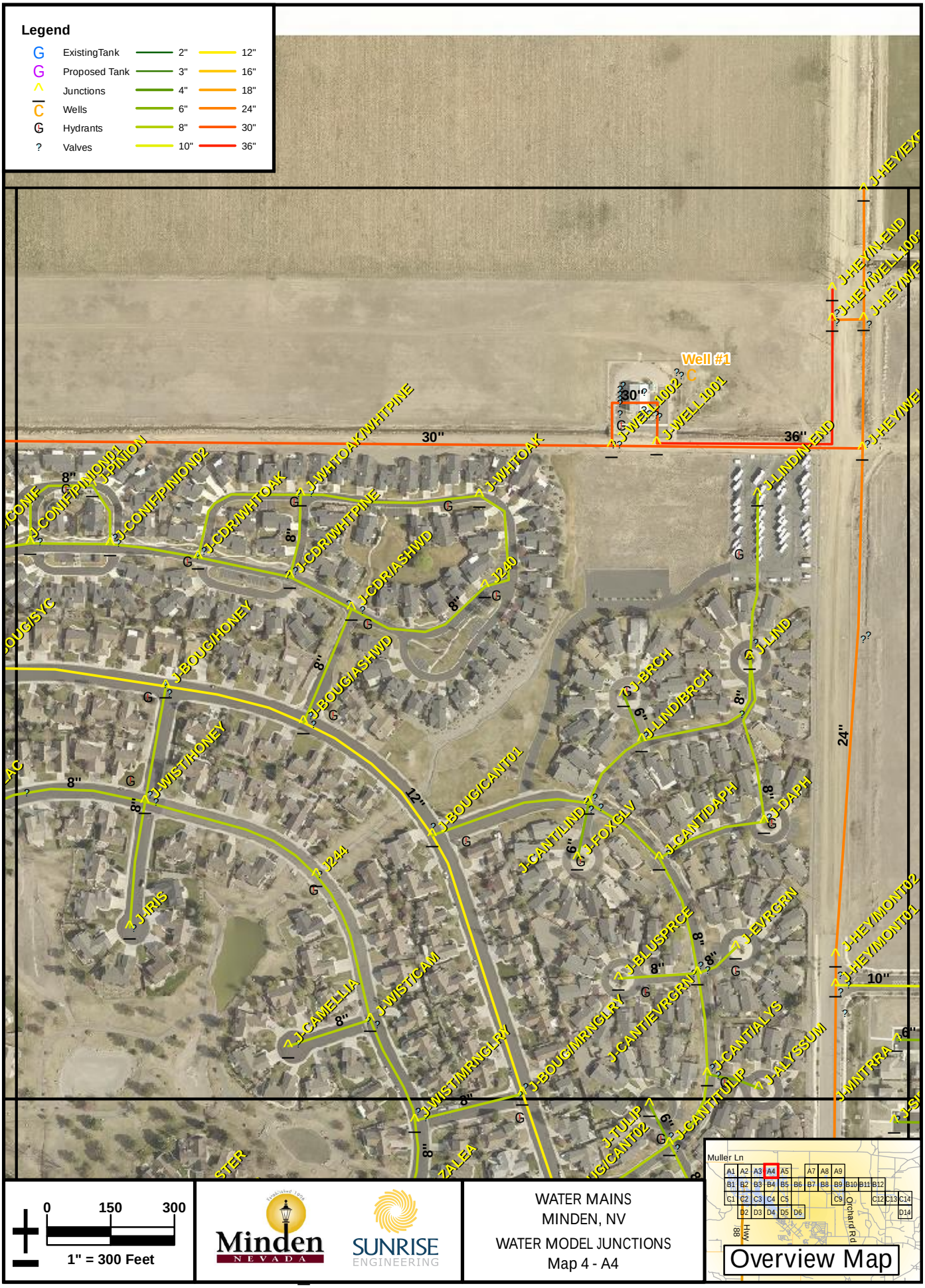

Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - B6
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map

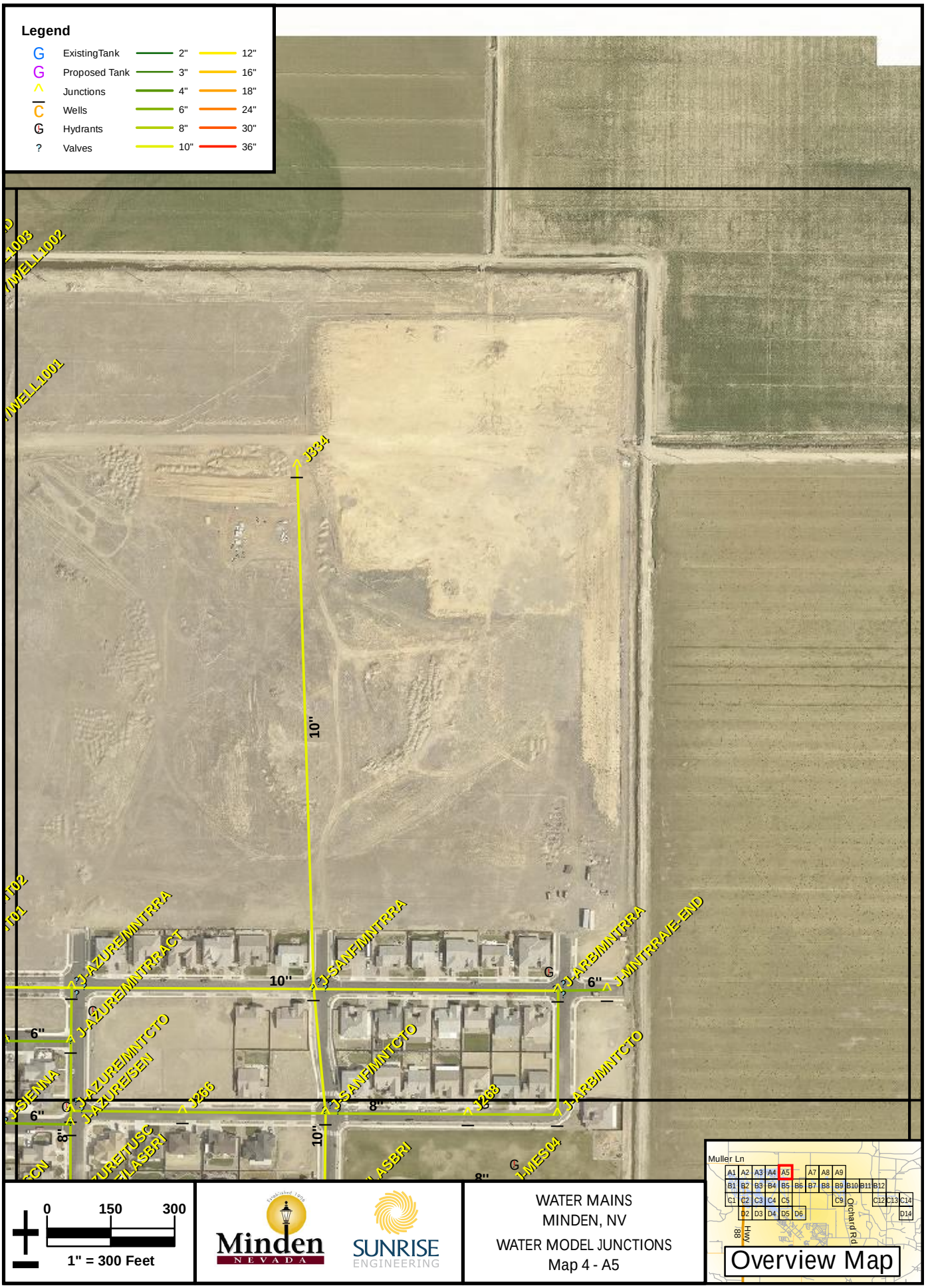

Legend
Wells
Hydrants Proposed
Hydrants Proposed Buffer
Hydrants
Hydrants Buffer
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
0
300
600
1" = 600 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER HYDRANTS
MINDEN, NV
HYDRANT COVERAGE
Map 3 - B7
Muller Ln
A1
A2
A3
A4
A5
A6
B1
B2
B3
B5
B6
B7
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-MAHOCIR
J-HEATHER
J-SHMRK
J84
J-TAMIMAHOCIR
J-TAMIHEATH
J90
J-MAHOITAM
J-TAMIWSTWD
J-MAHOILUP
J-LUPINE
J-TAMIFIR
J-CLVR
J86
J-MAHONWSTWD02
J-TAMIIRNWD
Well #4
J-FIRTREE
6"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A1
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-395/N-END
J-395/N-BOUND
J-N-BOUND
12"
J-MGSD-END
J-IRNWD/PND1
J-IRNWD/PND2
J-IRNWD/PND3
6"
J-WSTCOMM02
J-WSTCOMM01
10"
J-395/IRNWD
J-IRNWD02
J-IRNWD03
J104
COMM03
OAKWD
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A2
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-MV/N-END
J-MV04
J-MV16
J-MV15
J232
J234
J230
J-N-BOUND/MV
J-MV13
J-MV14
J-MV10
J-MV11
J-MV12
J-MV03
J-MV08
J-MV09
J-MV06
J235
J-MV02
J-MV05
J-MV07
J-MV/N-BOUND
J-L-ANT/N-BOUND
J-L-ANTBOUG01
J-L-LILAC
J-L-WIST/LILAC
J238
J242
J-L-ANTWIST01
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A3
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #1
J-WELL_1002
J-WELL_1001
30"
36"
24"
12"
10"
8"
6"
J-HEY/EXT
J-HEY/N-END
J-HEY/WELL100
J-HEY/NEW
J-LINDIN-END
J-WHTOAK/WHTPINE
J-WHTOAK
J-PINION
J-CONIF/PINION01
J-CONIF/PINION02
J-CDR/WHTOAK
J-CDR/WHTPINE
J-CDR/ASHWD
J240
J-BOUG/HONEY
J-BOUG/ASHWD
J-WIST/HONEY
J-BOUG/CANT01
J-LIND
J-BRCH
J-LIND/BRCH
J-CANT/LIND
J-FOXGLV
J-CANT/DAPH
J-DAPH
J244
J-IRIS
J-BLUSPRCE
J-EV/RGRN
J-HEY/MONT02
J-HEY/MONT01
J-CAMELLIA
J-WIST/CAM
J-CANT/EVRGRN
J-BOUG/MRNGLRY
J-CANT/ALYS
J-ALYSSUM
J-MNTRRA
J-WIST/MRNGLRY
J-TULIP
J-CANT/TULIP
J-TULIP/CANT02
ZALEA
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A4
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J334
10"
J-AZURE/MNTRRA
J-AZURE/MNTRRACT
J-SANF/MNTRRA
J-ARB/MNTRRA
J-MNTRRAIE-END
6"
J-AZURE/MNTCTO
J-AZURE/EISEN
J-SIENNA
J266
J268
8"
J-SANF/MNTCTO
J-ARB/MNTCTO
J-MES04
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A5
Muller Ln
Hwy 88
Orchard Rd
Overview Map

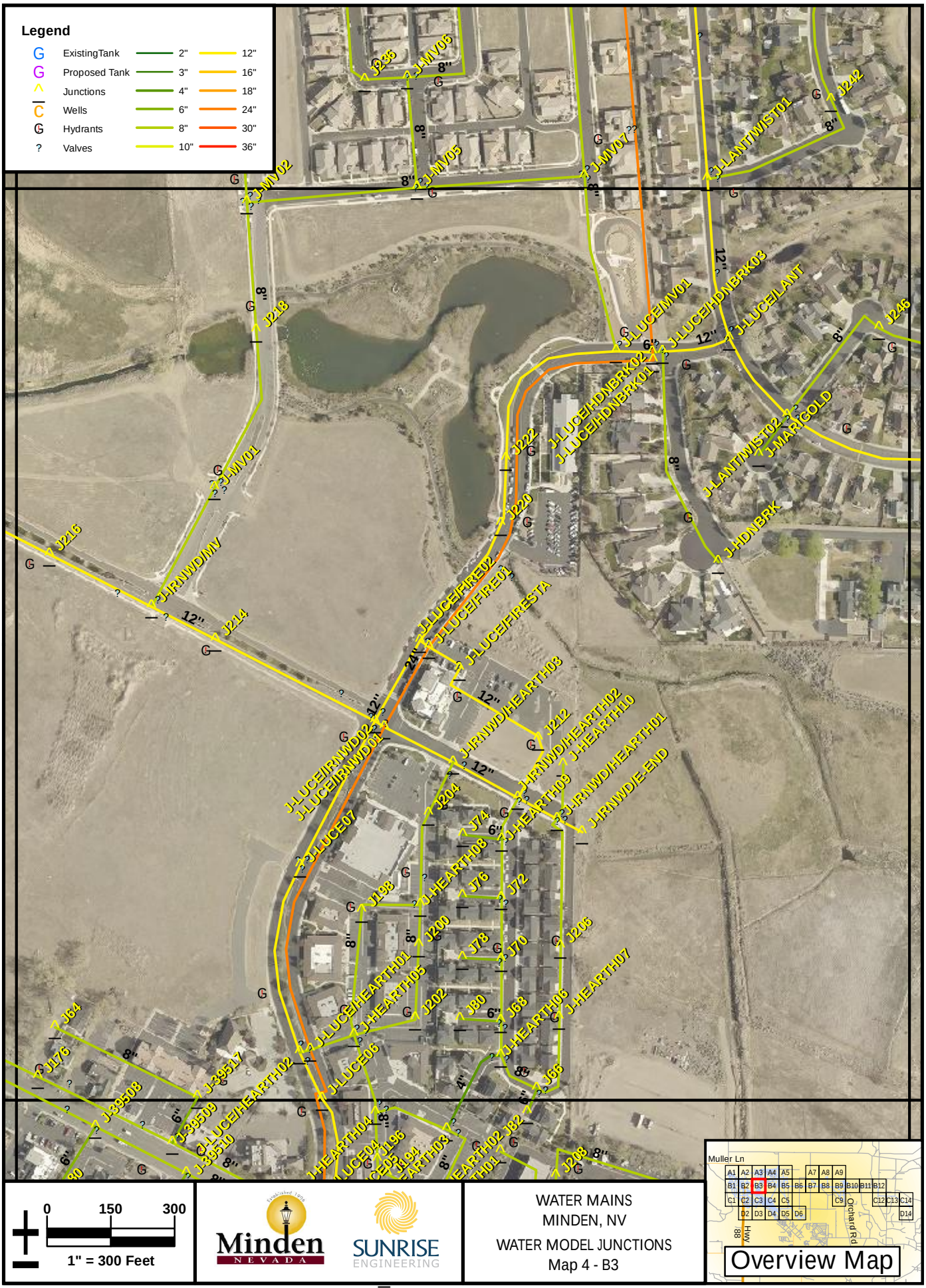

Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-BUCK14
J-BUCK13
J-BUCK12
6"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A7
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-SP28
J-SP29
J-SP27
8"
10"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A8
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-SP26
J-SP25
J-SP24
J-SP23
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - A9
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #4
J-MAHOILUP
J-LUPINE
J-TAMIFIR
J-CLVR
J-TAMIIRNWD
J-TAMIWELL04
J-FIRTREE
J-MAHOJCDRWD
J-IRNWD01
J-IRNWDCT
J-MAHOIIRNWD
J-CRDWD
J-WSTWDJCDR
J-CDRWD
J-CDRWDCT
J-MAHOIWSTWD
J-WSTWDJOAKWD
J-OAKWDJMPL
J-OAKWD01
J-LRCHWD
J-MAHOILARCH
J-WSTWD01
J-MAHOILNGLF02
J-WSTWDJMPL
J-FXTL
J-MAHOIFOXTL
J-BRSTLCIN
J-MAHOIBRIST
J-MAHOIWSTWD01
J86
J88
J92
J94
J96
J98
J100
J102
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B1
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-395/IRNWD
J-IRNWD02
J-IRNWD03
J-IRNWD/CVMED
J-IRNWD04
J-CVMED01
J-CVMED02
J-CVMED03
J-WSTCOMM02
J-WSTCOMM03
J-WSTCOMM04
J-WSTCOMM05
J-WSTCOMM06
J-WSTCOMM07
J-WSTCOMM08
J-WSTCOMM09
J-TAMPNWD
J-PNWD01
J-PNWD02
J-PNWD03
J-DHS01
J-DHS02
J-DHS03
J-DHS04
J-DHS05
J-DHS06
J-DHS07
J-DHS08
J-DHS09
J-HWY8807
J-HWY8806
J-39501
J-39502
J-39503
J-39504
J-39505
J-39506
J-39507
J-JCTCOMM05
J-JCTCOMM06
J-MNDNTOWN01
J-MNDNTOWN04
J104
J106
J108
J110
J112
J114
J116
J118
J12
J20
J22
J24
J26
J28
J30
J168
J170
J172
J174
J182
J184
J192
J224
J226
J228
6"
8"
10"
12"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B2
Muller Ln
Orchard Rd
Hwy 88
Overview Map

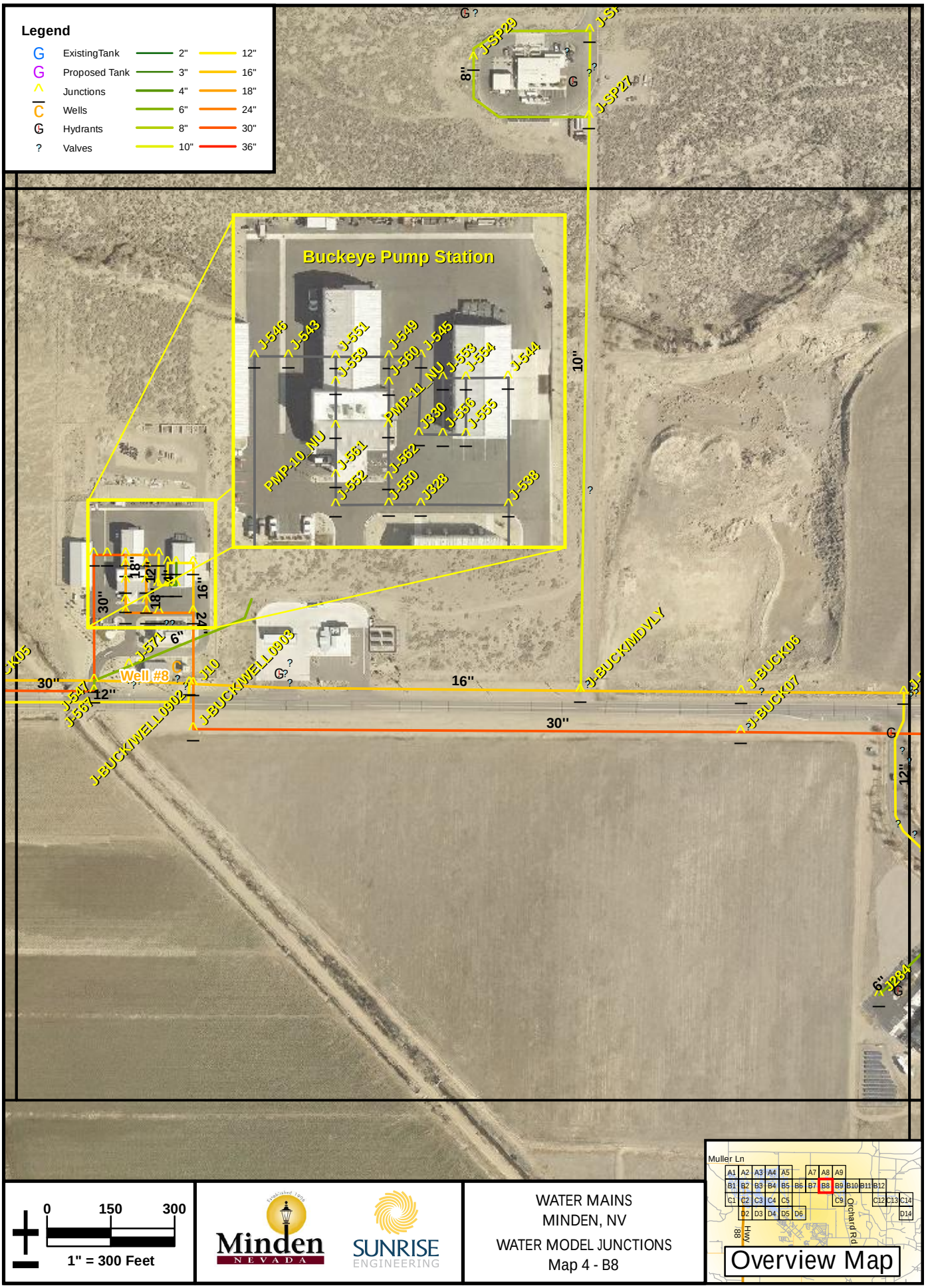

Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-MV06
J-MV05
J-MV07
J-MV02
J-MV01
J-LANTTWIST01
J-LUCE/MV01
J-LUCE/HDNBRK03
J-LUCE/HDNBRK02
J-LUCE/HDNBRK01
J-LUCE/LANT
J-LANTTWIST02
J-MARIGOLD
J-HDNBRK
J-LUCE/FIRE02
J-LUCE/FIRE01
J-LUCE/FIRESTA
J-IRNWD/MV
J-IRNWD/HEARTH03
J-IRNWD/HEARTH02
J-HEARTH10
J-IRNWD/HEARTH01
J-IRNWD/IE-END
J-LUCE/IRNWD02
J-LUCE/IRNWD01
J-LUCE07
J-HEARTH09
J-HEARTH08
J-LUCE/HEARTH01
J-HEARTH05
J-LUCE/HEARTH02
J-LUCE06
J-HEARTH06
J-HEARTH07
J-LUCE04
J-LUCE05
J-HEARTH04
J-HEARTH03
J-HEARTH02
J-HEARTH01
J-39517
J-39508
J-39509
J-39510
J218
J216
J214
J222
J220
J212
J204
J198
J200
J202
J206
J196
J194
J208
J242
J246
J236
J1176
J64
J74
J76
J72
J78
J70
J80
J68
J66
J82
J90
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B3
Muller Ln
Hwy 88
Orchard Rd
Overview Map

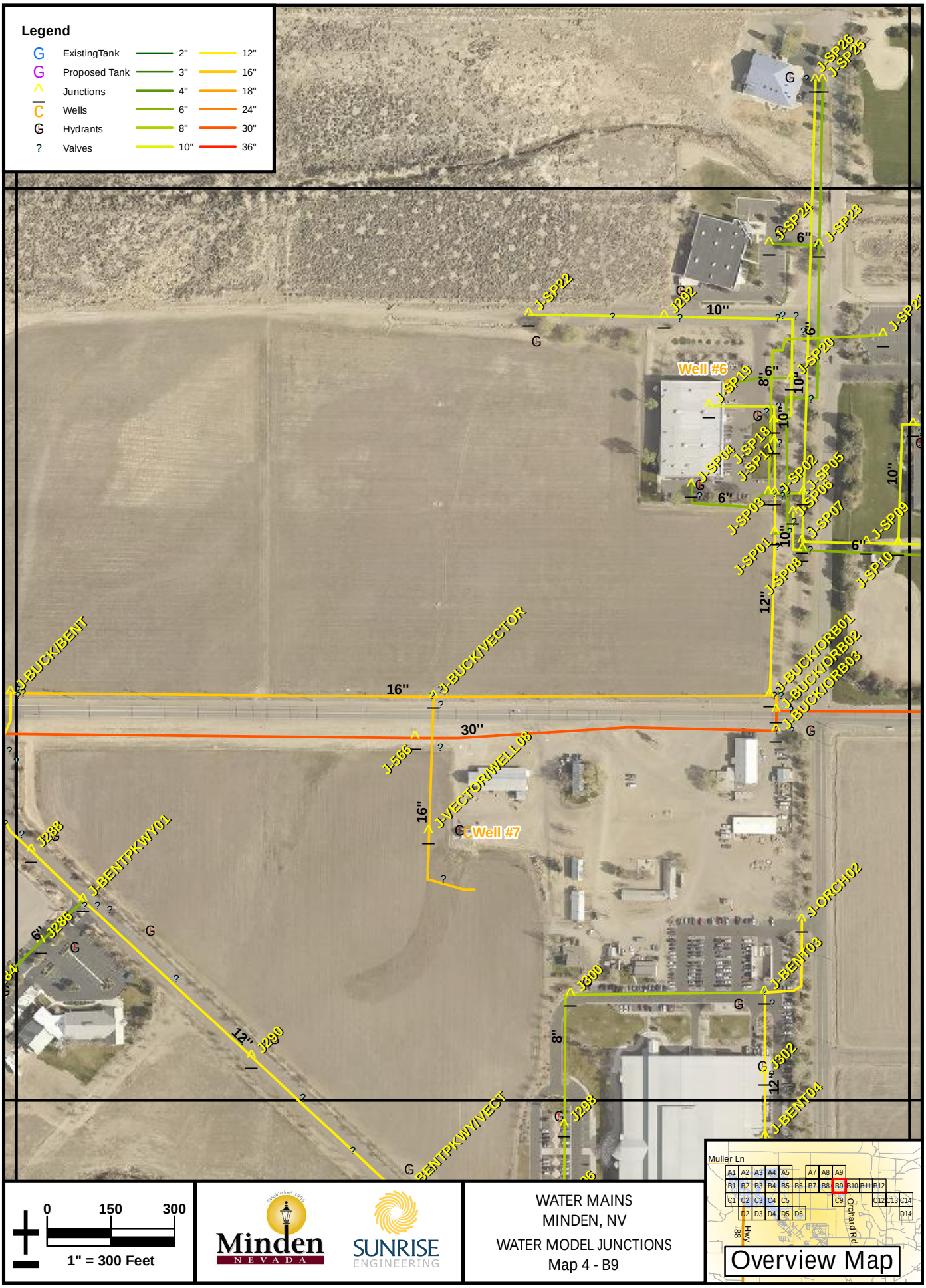

Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-CAMELLIA
J-WIST/CAM
J-BLUSPRG
J-BOUG/MRNGLRY
J-CANT/EVRGRN
J-CANT/ALYS
J-ALYSSUM
J-HEY/MONT
J-MNTRRA
J-WIST/MRNGLRY
J-TULIP
J-CANT/TULIP
J-BOUG/CANT02
J-LAV
J-LAV/S-END
J-ASTER
J-WIST/ASTER
J-WIST/VERB
J-WIST/AZALEA
J-AZALEA
J-LANT/VERB
J-LANT/BOUG02
J-HEY/CHANTEL
J-BOUG/WELL05-02
J-BOUG/FREIDA
J-BELSERA
J-FREIDA/W-END
J-BOUG/WELL05-01
J-BUCK/BOUG02
J-BUCK/BOUG03
J-BUCK/HEY01
J-BUCK/BOUG01
J-BUCK/BOUG04
J-BUCK/HEY02
J-BUCK01
J248
J250
J252
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B4
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-SANF/MNTR
J-ARB/MNTRRAIE
J-MNTRRAIE
J-SANF/MNTCTO
J-ARB/MNTCTO
J-AZURE/TUSC
J-AZURE/LASBRI
J-SANF/LASBRI
J-MES04
J-AZURE/FIORE
J-AZURE/CHAN
J-SANF/CHANTEL
J270
J272
J-AZURE/BEL
J-SANF/BALER
J-MES01
J-MES02
J-MES03
J-AZURE/GAL
J-GALIFNTE
J-GALIROSSO
J-SANF/GAL
J-MONTI
J-FONTE
J-ROSSO
J274
J-BUCK/SANF
J266
J268
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B5
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-BUCK02
J-BUCK03
30"
16"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B6
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-BUCK14
J-BUCK13
J-BUCK12
J-BUCK11
J-548
J-568
6"
6"
12"
16"
30"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B7
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Buckeye Pump Station
J-SP29
J-SP27
J-545
J-543
J-551
J-559
J-549
J-560
J-545
J-553
J-554
J-544
PMP-11_NU
J330
J-556
J-555
PMP-10_NU
J-561
J-562
J-552
J-550
J328
J-538
10"
30"
18"
12"
4"
16"
24"
6"
J-571
Well #8
J10
J-547
J-567
J-BUCKIWELL0902
J-BUCKIWELL0903
16"
J-BUCKIMDVLY
J-BUCK06
J-BUCK07
30"
12"
6"
J284
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B8
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #6
Well #7
J-SP26
J-SP25
J-SP24
J-SP23
J-SP22
J292
J-SP21
J-SP20
J-SP19
J-SP18
J-SP17
J-SP04
J-SP02
J-SP05
J-SP03
J-SP06
J-SP07
J-SP09
J-SP01
J-SP08
J-SP10
J-BUCK/BENT
J-BUCK/VECTOR
J-BUCK/ORB01
J-BUCK/ORB02
J-BUCK/ORB03
J-566
J-VECTOR/WELL08
J283
J-BENTPKWY01
J286
J-ORCH02
J-BENT03
J300
J302
J-BENT04
J290
J298
J-BENTPKWY/VECT
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B9
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-SP21
J-SP15
J-SP16
J-SP14
J-SP13
J294
10"
6"
J-SP11
J-SP12
30"
J-BUCK08
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B10
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
BUCK09
30"
?
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B11
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-BUCK10
J312
J314
J316
30"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - B12
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J96
J98
J102
J120
J142
J-BRSTLCN
J-MAHOIBRIST
J-MAHOIWSTWD01
J-MAHOILNGLF01
J-LNGLF01
6"
10"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C1
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-HWY8806
J-DHS08
J-JCTCOMM05
J-39502
J172
J-39505
J-39506
J-39507
J174
J182
J-MINDNTOWN04
J-JCTCOMM06
J-MINDNTOWN01
J184
J114
J-HWY8805
J192
J-JCTCOMM04
J186
J-MINDNTOWN02
J-MINDNTOWN05
J116
J118
J-DHS10
J-HWY8804
J-JCTCOMM02
J188
J-JCTCOMM03
J134
J-MINDNTOWN03
J-JCTCOMM01
J190
J122
J-CR/OULA
J-MAHO02
J32
J-MAHO01
J-88/CR
J128
J130
J-CR/LIB
J132
J44
J34
J40
J38
J36
J-LIBRARY
J-ASPNGRV/LIB
J-BELAR/OULA
J126
J48
J46
J-88/ASPNGRV
J-ASPNGRV
J-ZALD/OULA
J124
J-88/MACK
J-MACK/BURR
J-MACK/OULA
J-MACK/LUCE
J-BURR/LABA
J-LABA/BETHA
J-LABA/OULA
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C2
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #3
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C3
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #9
J-BUCKIWTR01
J-BUCKIWTR02
J-WATER01
J-WATER02
J-WATER03
J-WATER04
J-WATER05
J-BNTLYHER01
J-BNTLYHER02
J-CODGARAGE
J-395/5TH01
J-395/5TH02
J-395/6TH
J-395/7TH
J-395/3RD01
J-395/3RD02
J-395/3RD03
J-395/5
J-4TH/INEND
J-N.ALLEY/4TH
J-N.ALLEY/5TH
J-N.ALLEY/6TH
J-N.ALLEY/7TH
J-C.ALLEY/4TH
J-C.ALLEY/5TH
J-C.ALLEY/6TH01
J-C.ALLEY/6TH02
J-C.ALLEY/6TH03
J-C.ALLEY/7TH
J-S.ALLEY/5TH
J-S.ALLEY/6TH01
J-S.ALLEY/6TH02
J-S.ALLEY/6TH03
J-S.ALLEY/WELL02
J-CR/6TH
J-CR/WELL02
J-ESMI/3RD
J-ESMI/4TH
J-ESMI/5TH
J-ESMI/6TH
J-ESMI/7TH
J-MONO/3RD
J-MONO/5TH
J-MONO/6TH
J-MONO/6TH01
J-MONO/6TH02
J-C.ALLEY/2ND
J52
J54
J56
J58
J60
J148
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C4
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
8"
J332
8"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C5
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J300
J-BENT03
J302
J-BENT04
J298
J-BENTPKWY/VECT
J296
J304
J-BENT01
J-BENT02
J-ORCH01
J-BENTPKWY02
J306
J310
J308
J-BENTPKWY/ORCH
8"
12"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C9
Muller Ln
Orchard Rd
Hwy 88
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J316
J.E. VLY/AMBER
30"
J318
J320
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C12
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J322
J324
J-AMBER
30"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C13
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J326
30"
?
?
Muller Ln
Hwy 88
Orchard Rd
Overview Map
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - C14


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-88/MACK
J-MACK/BURR
J-MACK/JOULA
J-MACK/LUCE
J-BURR/LABA
J-BURR/END
J-LABA/BEHIA
J-LABA/JOULA
J-LABA/E-END
J-BEHIA/END
8"
6"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - D2
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J-BELARIE-END
J-ZALD/10TH
J-ZALDIE-END
J-MACK/10TH
J-MACKIE-END
J-10THIS-END
J-S.ALLEY/8TH
J-CR/8TH
J-WLDRSW-END
J-WLDRS/7TH
J-CR/7TH
6"
8"
4"
18"
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - D3
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
Well #2
J-S.ALLEY/5TH
J-CR/WELL02
J-WELL02
J-S.ALLEY/WELL02
J-CR/5TH
J-S.ALLEY/3RD
J-MONO/3RD
J-C.ALLEY/3RD
J-ES/M/3RD
J-C.ALLEY/2ND
J-MONO/2ND
J-CR/3RD
J-CR/2ND
J-MONO/39501
J-MONO/39502
J-MONO/39504
J-S.ALLEY/1ST
J-CR/1ST
J-WLDRS/2ND
J-DES/2ND
J-DES/W-END
J-SPRCE/LOOP02
J-WLDRS/BRCH
J-WLDRS/E-END
J-DES/BRCH
J-BRCH/W-END
J-SPRCE/LOOP01
J-DES/S-END
J-SPRCE
J-CR/395
J-395/3RD01
J-395/3RD02
J-395/3RD03
J-N.ALLEY/4TH
J-ES/M/4TH
J-C.ALLEY/4TH
J-MONO/5TH
J-S.ALLEY/5TH
J-CR/6TH
J156
J164
J166
J258
J260
J262
J160
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - D4
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J254
J-ZERO01
J-ZERO03
J-ZERO02
12"
J256
J276
8"
J262
J-395IE-END
4"
J264
8"
J-CRIE-END
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - D5
Muller Ln
Hwy 88
Orchard Rd
Overview Map


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
J278
J280
J282
J-SNAFFLEIN-END
J-HEY/SNAFFLE01
J-OXYOKEIW-END
J-OXYOKEILASSO
J-GILMANIN-END
J-GILMANIOXYOKE
J-HEY/SNAFFLE02
J-LASSOIW-END
J-SNAFFLEILASSO
J-SNAFFLEIS-END
J-HEY/LASSO
J-HEY/GILMAN
J-HEY/E-END
J-LASSO01
J-GILMANIS-END
8"
12"
Muller Ln
Hwy 88
Orchard Rd
Overview Map
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - D6


Legend
ExistingTank
Proposed Tank
Junctions
Wells
Hydrants
Valves
2"
3"
4"
6"
8"
10"
12"
16"
18"
24"
30"
36"
30"
J-AMBRTANK01
J-AMBRTANK02
ExistingTank G
Proposed Tank G
0
150
300
1" = 300 Feet
Minden
NEVADA
SUNRISE
ENGINEERING
WATER MAINS
MINDEN, NV
WATER MODEL JUNCTIONS
Map 4 - D14
Muller Ln
Hwy 88
Orchard Rd
Overview Map

APPENDIX B

OPINION OF PROBABLE COST

SUNRISE ENGINEERING, INC.
11 North 300 West, Washington, Utah 84780
Tel: (435) 652-8450 Fax: (435) 652-8416

Engineer's Opinion of Probable Cost

5-Year and 20-Year Recommend System Improvements 5/15/2017
Minden, Nevada

SBH

NO.	DESCRIPTION	Estimated Quantity	Units	Unit Price	TOTAL COST
5 YEAR RECOMMENDED IMPROVEMENTS					
Portable Generator					
1	Portable Generator	1	LS	$ 115,000	$ 115,000
Replace Pipes Installed Prior to 1960					
2	Replace Pipes Installed Prior to 1960 - 6"	1,926	LF	$ 125	$ 241,000
3	Replace Pipes Installed Prior to 1960 - 8"	2,459	LF	$ 130	$ 320,000
Install Meter, Meter Pit, and Radio Read Equipment					
4	Install Meter	500	EA	$ 140	$ 70,000
5	Install Radio Read Equipment	500	EA	$ 90	$ 45,000
6	Install Meter Pit, Meter Setter, and Connection	500	EA	$ 440	$ 220,000
Fire Flow Improvements					
7	Fire Flow Improvements - Ironwood (8" Pipe)	590	LF	$ 130	$ 77,000
8	Fire Flow Improvements - Highway 395 (8" Pipe)	187	LF	$ 130	$ 25,000
	TOTAL 5-YEAR PROJECT COST				**$ 1,113,000**
10-YEAR RECOMMENDED IMPROVEMENTS					
Backup Power Generation					
9	Backup Power Generation	2	EA	$ 138,000	$ 276,000
Replace All Asbestos Cement Pipe					
10	Replace All Asbestos Cement Pipe - 4"	2,674	LF	$ 121	$ 324,000
11	Replace All Asbestos Cement Pipe - 6"	26,977	LF	$ 125	$ 3,373,000
12	Replace All Asbestos Cement Pipe - 8"	23,458	LF	$ 130	$ 3,050,000
13	Replace All Asbestos Cement Pipe - 10"	540	LF	$ 138	$ 75,000
14	Replace All Asbestos Cement Pipe - 12"	186	LF	$ 150	$ 28,000
Install Meter, Meter Pit, and Radio Read Equipment					
15	Install Radio Read Equipment	240	EA	$ 90	$ 22,000
16	Install Meter Pit, Meter Setter, and Connection	240	EA	$ 440	$ 106,000
New Hydrant and Associated Improvements					
17	Install Fire Hydrant, Gate Valve, and Hydrant Lateral	11	EA	$ 6,000	$ 66,000
	TOTAL 20-YEAR PROJECT COST				**$ 7,354,000**

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

APPENDIX C

MODEL RESULTS

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J10	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4	27219	27219	27182
J100	4,705.00	3.5	7.0	3.6	7.1	4.3	8.6	80.9	79.8	79.8	79.4	82.8	73.9	2157	2128	2799
J102	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	79.9	78.9	78.9	78.4	81.9	72.9	2032	2005	2596
J104	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	78.9	78.3	77.8	77.9	81.0	72.4	3606	3543	6995
J106	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	78.9	78.3	77.8	77.9	81.0	72.4	3429	3369	6197
J108	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	79.0	78.3	77.9	77.9	81.1	72.4	3294	3238	5696
J-10TH/S-E	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	72.4	71.7	71.9	75.0	66.5			
J-10TH01	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.6	71.4	70.6	71.0	73.9	65.6			
J110	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	78.1	77.5	77.0	77.0	80.2	71.5	3219	3163	5523
J112	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.2	76.6	76.2	76.2	79.4	70.7	3092	3038	5177
J114	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.6	76.0	75.5	75.6	78.7	70.1	2722	2676	4182
J116	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.6	76.0	75.5	75.6	78.8	70.1	2805	2757	4406
J118	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.6	76.0	75.5	75.6	78.8	70.1	2900	2850	4678
J12	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	79.4	78.7	78.3	78.3	81.5	72.8			
J120	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	79.4	78.5	78.4	78.1	81.4	72.6	3315	3258	5656
J122	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	75.0	74.4	74.0	74.0	77.2	68.5	3321	3257	6300
J124	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.2	73.6	73.1	73.2	76.3	67.7	2682	2635	4170
J126	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.5	74.9	74.4	74.5	77.6	69.0	2827	2778	4499
J128	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	76.0	75.4	74.9	75.0	78.1	69.5	2781	2733	4324
J130	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.4	75.8	75.3	75.4	78.5	69.9	2751	2705	4225
J132	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.3	75.8	75.2	75.4	78.5	69.9	2722	2677	4188
J134	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.4	72.9	73.0	76.1	67.5	2860	2807	4769
J136	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.1	73.4	73.7	76.7	68.2	3093	3035	5587
J138	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.1	73.4	73.7	76.7	68.2	3109	3050	5665
J14	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	79.4	78.7	78.3	78.3	81.5	72.8	2203	2171	2941
J140	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.1	73.4	73.7	76.7	68.2	2525	2482	3798
J142	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	73.7	73.0	73.2	76.3	67.7	3083	3024	5605
J144	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	71.5	70.6	71.1	74.0	65.7	3214	3147	6812
J146	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.2	70.3	70.8	73.7	65.4	3688	3603	12614
J148	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	71.0	71.0	70.0	70.7	73.4	65.4	3627	3542	12008
J150	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.9	71.7	70.9	71.3	74.2	65.9	3136	3073	6228
J152	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.2	70.4	70.8	73.7	65.4	2345	2304	3505
J154	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	69.9	69.8	68.9	69.4	72.2	64.0	2391	2347	3700
J156	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.6	69.3	68.5	68.9	71.7	63.4	1681	1654	2181
J158	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.9	69.8	68.9	69.4	72.2	64.1	2657	2604	4545
J16	4,712.00	0.0	0.0	0.0	0.0	0.0	0.0	76.1	75.6	75.1	75.2	78.3	69.7	2257	2222	3128
J160	4,733.00	3.5	7.0	3.6	7.1	4.3	8.6	67.5	67.3	66.5	66.9	69.7	61.5	2303	2258	3598
J164	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.6	69.3	68.5	68.9	71.7	63.3	1663	1636	2149
J166	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	68.9	68.1	68.5	71.3	62.9	1723	1694	2266
J168	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	75.6	75.1	74.5	74.7	77.8	69.2	3140	3081	5615
J170	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	76.7	76.3	75.6	75.9	78.9	70.4	1726	1702	2161
J172	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.0	74.6	74.0	74.2	77.2	68.7	3240	3178	6151

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J174	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.2	73.7	73.1	73.3	76.4	67.8	3170	3108	5941
J176	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.9	72.7	71.9	72.3	75.2	66.9	2732	2681	4498
J178	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.4	73.2	72.3	72.8	75.7	67.3	1864	1836	2445
J18	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	74.9	74.3	73.8	73.9	77.0	68.4	2061	2030	2768
J180	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	74.3	74.0	73.3	73.6	76.6	68.2	1983	1953	2641
J182	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	72.8	72.1	72.4	75.4	66.9	3016	2958	5460
J184	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.8	73.3	72.7	72.9	76.0	67.4	2823	2771	4683
J186	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.8	73.4	72.8	72.9	76.0	67.4	3192	3129	6080
J188	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.4	72.9	73.0	76.1	67.5			
J190	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	73.9	73.3	73.4	76.6	67.9	1985	1954	2632
J192	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.4	72.8	73.0	76.1	67.5	3196	3134	6066
J194	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	73.6	73.5	72.6	73.1	76.0	67.7	3367	3299	7312
J196	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	73.6	73.5	72.6	73.1	76.0	67.7	3372	3303	7341
J198	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.8	72.9	73.4	76.3	68.0	3378	3310	7333
J20	4,711.00	0.0	0.0	0.0	0.0	0.0	0.0	76.6	76.0	75.5	75.6	78.7	70.1	2244	2209	3088
J200	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.8	72.9	73.4	76.3	68.0	3408	3339	7538
J202	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	74.3	73.3	73.9	76.7	68.5	3439	3370	7619
J204	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.8	73.7	72.7	73.3	76.1	67.9	3511	3439	8389
J206	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	71.5	70.5	71.1	73.9	65.7	3051	2989	5992
J208	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	72.2	72.0	71.2	71.6	74.5	66.2	2975	2917	5481
J210	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.2	70.3	70.8	73.7	65.4	2977	2918	5608
J212	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.8	72.7	71.7	72.3	75.2	67.0	3677	3596	11056
J214	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.8	74.9	75.4	78.3	70.0	3830	3749	10388
J216	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	76.9	76.8	75.9	76.3	79.3	70.9	3797	3719	9346
J218	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	75.5	75.4	74.5	75.0	77.9	69.5	3132	3080	5696
J22	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.2	76.6	76.2	76.2	79.4	70.7	2827	2779	4398
J220	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	77.3	77.4	76.3	77.0	79.8	71.6	3946	3866	11473
J222	4,705.00	3.5	7.0	3.6	7.1	4.3	8.6	77.7	77.7	76.7	77.4	80.2	72.0	3961	3881	11397
J224	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	77.6	77.3	76.5	76.9	79.8	71.4	3550	3483	7280
J226	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	78.0	77.7	76.9	77.3	80.3	71.9	3570	3503	7300
J228	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	77.5	77.3	76.5	76.9	79.8	71.4	3766	3692	8732
J230	4,712.00			2.2	4.3	8.3	16.6			74.0	74.5	77.4	69.0		2844	4874
J232	4,711.00			2.2	4.3	8.3	16.6			74.5	74.9	77.8	69.4		3038	5543
J234	4,712.00			2.2	4.3	8.3	16.6			74.0	74.5	77.4	69.0		3013	5495
J236	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.7	74.9	75.3	78.2	69.8	3106	3109	5786
J238	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	72.6	72.8	71.5	72.5	75.1	67.2	3470	3396	8979
J24	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.0	76.4	75.9	76.0	79.1	70.5			
J240	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	71.3	71.6	70.2	71.2	73.9	66.0	2656	2605	4548
J242	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.2	75.5	74.2	75.1	77.8	69.8	3065	3009	5693
J244	4,709.00	3.5	7.0	3.6	7.1	4.3	8.6	75.6	76.0	74.6	75.6	78.2	70.4	3073	3017	5679
J246	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	74.2	72.9	73.9	76.5	68.6	3108	3049	6067
J248	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	73.0	71.6	72.6	75.3	67.4	3485	3411	9107

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J250	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	71.0	71.4	69.9	71.1	73.6	65.9	3428	3351	9488
J252	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	72.4	70.5	72.0	74.4	67.1	2051	2017	2922
J254	4,733.00	0.0	0.0	0.0	0.0	0.0	0.0	67.5	67.3	66.5	66.9	69.5	61.1	2770	2706	6145
J256	4,737.00	0.0	0.0	0.0	0.0	0.0	0.0	65.8	65.5	64.7	65.1	67.6	59.0	2302	2247	4766
J258	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	68.9	68.1	68.5	71.3	62.9	1818	1787	2445
J26	4,710.00	0.0	0.0	0.0	0.0	0.0	0.0	77.0	76.4	75.9	76.0	79.1	70.5	2822	2774	4423
J260	4,733.00	3.5	7.0	3.6	7.1	4.3	8.6	67.4	67.2	66.4	66.7	69.6	61.1	1717	1686	2289
J262	4,741.00	3.5	7.0	3.6	7.1	4.3	8.6	64.0	63.8	63.0	63.4	66.1	57.7	1060	1043	1257
J264	4,741.00	3.5	7.0	3.6	7.1	4.3	8.6	64.1	63.8	63.0	63.4	66.1	57.7	899	885	1035
J266	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	68.2	69.0	67.2	68.7	71.0	63.5	2935	2869	6390
J268	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.1	66.9	65.0	66.5	68.8	61.3	2685	2624	5381
J270	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	67.2	68.1	66.2	67.8	70.1	62.8	2465	2414	4333
J272	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.3	67.3	65.3	66.9	69.2	61.9	2330	2282	3937
J274	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	66.9	68.0	65.9	67.7	69.9	62.8	3236	3156	10835
J276	4,737.00	0.0	0.0	0.0	0.0	0.0	0.0	65.8	65.5	64.7	65.1	67.5	58.9	2213	2160	4548
J278	4,738.00	0.0	0.0	0.0	0.0	0.0	0.0	65.3	65.1	64.3	64.6	67.1	58.4	2116	2065	4055
J28	4,710.00	0.0	0.0	0.0	0.0	0.0	0.0	77.0	76.4	75.9	76.0	79.1	70.5	2857	2808	4520
J280	4,741.00	0.0	0.0	0.0	0.0	0.0	0.0	64.0	63.8	63.0	63.3	65.8	57.1	2000	1952	3652
J282	4,743.00	3.5	7.0	3.6	7.1	4.3	8.6	63.2	62.9	62.1	62.4	64.9	56.2	1920	1874	3383
J284	4,778.00	3.5	7.0	3.6	7.1	4.3	8.6	124.4	123.9	124.4	123.8	124.1	122.2	3351	3351	3322
J286	4,779.00	3.5	7.0	3.6	7.1	4.3	8.6	124.0	123.4	124.0	123.3	123.7	121.8	4947	4947	4886
J288	4,780.00	3.5	7.0	3.6	7.1	4.3	8.6	123.6	123.0	123.6	122.9	123.2	121.4	14207	14206	13790
J290	4,782.00	3.5	7.0	3.6	7.1	4.3	8.6	122.7	122.1	122.7	122.0	122.4	120.5	9674	9673	8806
J292	4,806.00	3.5	7.0	3.6	7.1	4.3	8.6	112.3	111.8	112.3	111.7	112.0	110.3	6763	6762	6649
J294	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	6299	6298	6191
J296	4,802.00	3.5	7.0	3.6	7.1	4.3	8.6	114.1	113.4	114.1	113.4	113.7	111.8	6026	6025	5922
J298	4,806.00	3.5	7.0	3.6	7.1	4.3	8.6	112.3	111.7	112.3	111.6	112.0	110.1	5627	5626	5534
J30	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.0	76.4	75.9	76.0	79.1	70.5			
J300	4,808.00	3.5	7.0	3.6	7.1	4.3	8.6	111.5	110.9	111.5	110.8	111.1	109.2	5445	5444	5357
J302	4,813.00	3.5	7.0	3.6	7.1	4.3	8.6	109.3	108.7	109.3	108.6	109.0	107.0	6122	6121	6010
J304	4,809.00	3.5	7.0	3.6	7.1	4.3	8.6	111.0	110.4	111.0	110.3	110.7	108.8	6382	6381	6264
J306	4,807.00	3.5	7.0	3.6	7.1	4.3	8.6	111.9	111.3	111.9	111.2	111.6	109.6	6052	6051	5945
J308	4,794.00	3.5	7.0	3.6	7.1	4.3	8.6	117.5	116.9	117.5	116.8	117.2	115.3	6636	6635	6518
J310	4,793.00	3.5	7.0	3.6	7.1	4.3	8.6	117.9	117.3	117.9	117.3	117.6	115.7	6803	6802	6679
J312	4,869.00	0.0	0.0	0.0	0.0	0.0	0.0	84.9	84.6	84.9	84.6	84.7	83.8	29748	29748	28398
J314	4,877.00	0.0	0.0	0.0	0.0	0.0	0.0	81.4	81.2	81.4	81.1	81.3	80.4	30763	30762	29413
J316	4,883.00	0.0	0.0	0.0	0.0	0.0	0.0	78.8	78.6	78.8	78.6	78.7	77.9	31363	31362	30012
J318	4,890.00	0.0	0.0	0.0	0.0	0.0	0.0	75.8	75.6	75.8	75.6	75.7	75.0	32894	32893	31543
J32	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	77.2	76.5	76.2	76.1	79.3	70.5			
J320	4,891.00	0.0	0.0	0.0	0.0	0.0	0.0	75.3	75.2	75.3	75.1	75.2	74.6	34484	34484	33134
J322	4,902.00	0.0	0.0	0.0	0.0	0.0	0.0	70.6	70.4	70.6	70.4	70.5	69.9	34214	34213	32800
J324	4,915.00	0.0	0.0	0.0	0.0	0.0	0.0	64.9	64.8	64.9	64.8	64.9	64.3	33904	33904	26788

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J326	4,959.00	0.0	0.0	0.0	0.0	0.0	0.0	45.9	45.8	45.9	45.8	45.8	45.6	36393	36392	29836
J328	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4			
J330	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	66.0	53.9	66.0	53.9	54.9	53.6			
J332	4,731.00			21.5	43.0	513.7	1025.4			67.3	67.6	68.8	59.7		1296	4765
J334	4,727.00			21.5	43.0	156.9	313.3			66.3	67.8	70.0	62.2		2208	3602
J34	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.7	76.0	75.7	75.6	78.8	70.1			
J36	4,714.00	0.0	0.0	0.0	0.0	0.0	0.0	75.9	75.2	74.8	74.7	78.0	69.2	1731	1707	2155
J38	4,714.00	0.0	0.0	0.0	0.0	0.0	0.0	75.9	75.2	74.8	74.7	78.0	69.2			
J-395/10TH	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.2	70.3	70.8	73.7	65.4	3446	3370	8623
J-395/10TH	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.2	70.3	70.8	73.7	65.4			
J-395/3RD	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.5	62.3			
J-395/3RD	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.5	62.2			
J-395/3RD	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.5	62.2	1403	1381	1735
J-395/5TH	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.0	68.1	68.6	71.4	63.2	3075	3008	6537
J-395/5TH	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.0	68.1	68.6	71.4	63.2			
J-395/6TH	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.6	69.5	68.6	69.1	71.8	63.7	3574	3489	12054
J-395/7TH	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	70.3	70.2	69.3	69.8	72.6	64.4			
J-395/8TH	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.2	70.4	70.8	73.7	65.4	3174	3108	6597
J-395/8TH	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.0	70.8	70.0	70.4	73.3	65.0			
J-395/9TH	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.2	71.0	70.2	70.6	73.5	65.2			
J-395/CVI	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.0	70.8	69.9	70.4	73.3	65.0	3399	3324	8356
J-395/E-EN	4,740.00	3.5	7.0	3.6	7.1	4.3	8.6	64.5	64.3	63.4	63.8	66.5	58.1	1909	1871	2800
J-395/IRNV	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	77.4	77.0	76.3	76.6	79.6	71.1			
J-395/LUCI	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	71.4	70.5	71.0	73.9	65.6	3694	3608	12682
J-395/LUCI	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	71.4	70.5	71.0	73.9	65.6			
J-395/LUCI	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	71.6	71.5	70.6	71.1	74.0	65.7			
J-395/LUCI	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	71.4	70.5	71.0	73.9	65.6			
J-395/LUCI	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	71.4	70.5	71.0	73.9	65.6			
J-395/N-BC	4,703.00	3.5	7.0	3.6	7.1	4.3	8.6	79.5	79.1	78.3	78.7	81.6	73.2	3666	3637	7735
J-395/N-EN	4,704.00	3.5	7.0	3.6	7.1	4.3	8.6	79.0	78.7	77.9	78.2	81.2	72.7	3491	3461	6861
J-39501	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	75.5	75.0	74.4	74.6	77.7	69.1	3399	3332	6832
J-39502	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.4	74.8	75.0	78.1	69.5	3367	3302	6616
J-39503	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	76.7	76.3	75.6	75.9	78.9	70.4			
J-39504	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	75.8	75.4	74.8	75.0	78.0	69.5			
J-39505	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.4	73.2	72.4	72.8	75.7	67.3	2625	2578	4136
J-39506	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	72.8	72.4	71.8	72.0	75.1	66.5			
J-39507	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.4	73.1	72.3	72.7	75.7	67.3	2674	2626	4285
J-39508	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.6	72.8	73.2	76.2	67.8			
J-39509	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	72.0	71.8	71.0	71.4	74.3	66.0	2931	2873	5311
J-39510	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	72.1	71.9	71.0	71.5	74.4	66.0	3060	2999	5838
J-39511	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	71.6	71.4	70.5	71.0	73.9	65.6			
J-39512	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.3	71.1	70.2	70.7	73.6	65.3	3459	3383	8856

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-39513	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	70.0	69.8	69.0	69.4	72.3	64.0	3391	3314	8765
J-39514	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	70.0	69.9	69.0	69.5	72.3	64.0			
J-39515	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.0	68.1	68.6	71.4	63.2			
J-39517	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.9	72.7	71.8	72.3	75.2	66.9	2192	2156	3102
J40	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.2	74.8	74.7	78.0	69.2	1316	1299	1542
J42	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	78.5	77.8	77.5	77.4	80.6	71.8	1716	1693	2104
J44	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.8	76.1	75.8	75.6	78.9	70.1			
J46	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.2	73.6	73.1	73.2	76.3	67.7	2699	2651	4215
J48	4,717.00	0.0	0.0	0.0	0.0	0.0	0.0	74.2	73.6	73.1	73.2	76.3	67.7			
J-4TH/N-EI	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.0	68.1	68.6	71.4	63.2			
J50	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	70.6	70.4	69.6	70.0	72.9	64.6			
J52	4,724.00	0.0	0.0	0.0	0.0	0.0	0.0	70.8	70.6	69.7	70.2	73.1	64.8	2842	2786	5123
J-538	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4			
J54	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.3	70.4	70.9	73.7	65.5			
J-543	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	50.1	53.7	49.1	53.6	54.8	52.6			
J-544	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.1	127.8	127.0	127.4	125.0			
J-545	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	66.0	53.7	66.0	53.6	54.8	52.7			
J-546	4,770.00	3.5	7.0	3.6	7.1	4.3	8.6	50.1	53.7	49.1	53.6	54.8	52.6			
J-547	4,770.00	3.5	7.0	3.6	7.1	4.3	8.6	50.1	53.6	49.1	53.6	54.8	52.6			
J-548	4,760.00	0.0	0.0	0.0	0.0	0.0	0.0	54.4	57.6	53.3	57.5	58.8	56.1			
J-549	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	50.1	53.7	49.1	53.6	54.8	52.6			
J-550	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4			
J-551	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	50.1	53.7	49.1	53.6	54.8	52.6			
J-552	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4			
J-553	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.0	127.8	126.9	127.3	124.5			
J-554	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.0	127.8	126.9	127.3	124.5			
J-555	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	66.0	54.5	66.0	54.4	55.4	54.3			
J-556	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	66.0	54.0	66.0	54.0	55.0	53.9			
J-559	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	50.1	53.7	49.1	53.6	54.8	52.6			
J56	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.3	70.4	70.9	73.7	65.5			
J-560	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	50.1	53.7	49.1	53.6	54.8	52.6			
J-561	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4			
J-562	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4			
J-566	4,802.11	0.0	0.0	0.0	0.0	0.0	0.0	113.9	113.4	113.9	113.4	113.6	111.9			
J-567	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	49.3	50.5	48.3	50.2	52.4	45.7			
J-568	4,760.00	0.0	0.0	0.0	0.0	0.0	0.0	53.7	54.8	52.6	54.5	56.7	50.0			
J-571	4,767.30	3.5	7.0	3.6	7.1	4.3	8.6	59.1	62.2	58.2	62.2	63.3	61.3			
J58	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.9	69.8	68.9	69.4	72.2	64.1			
J60	4,733.00	3.5	7.0	3.6	7.1	4.3	8.6	68.2	68.1	67.2	67.7	70.4	62.4			
J62	4,733.00	3.5	7.0	3.6	7.1	4.3	8.6	69.7	69.6	68.7	69.2	71.9	64.0			
J64	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.9	72.7	71.8	72.3	75.2	66.9			
J66	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.2	72.2	72.8	75.6	67.4	3061	3002	5767

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J68	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.2	72.2	72.8	75.6	67.4			
J70	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	74.1	74.1	73.0	73.7	76.5	68.3	3170	3110	6147
J72	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	74.1	74.1	73.0	73.7	76.5	68.3			
J74	4,714.00	0.0	0.0	0.0	0.0	0.0	0.0	74.1	74.1	73.0	73.7	76.5	68.3			
J76	4,715.00	0.0	0.0	0.0	0.0	0.0	0.0	73.7	73.6	72.6	73.2	76.1	67.8			
J78	4,716.00	0.0	0.0	0.0	0.0	0.0	0.0	73.2	73.2	72.2	72.8	75.6	67.4			
J80	4,717.00	0.0	0.0	0.0	0.0	0.0	0.0	72.8	72.8	71.8	72.4	75.2	67.0			
J82	4,717.00	0.0	0.0	0.0	0.0	0.0	0.0	72.8	72.8	71.8	72.4	75.2	67.0			
J84	4,700.00	3.5	7.0	3.6	7.1	4.3	8.6	84.1	82.8	83.1	82.4	85.9	76.9	1753	1732	2115
J86	4,695.00	3.5	7.0	3.6	7.1	4.3	8.6	86.2	85.0	85.2	84.6	88.1	79.1	2286	2256	2946
J88	4,697.00	3.5	7.0	3.6	7.1	4.3	8.6	85.3	84.1	84.3	83.6	87.1	78.1	2396	2363	3158
J-88/ASPN	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.2	76.7	76.2	76.3	79.4	70.7			
J-88/CR	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.6	75.0	74.5	74.6	77.7	69.0	3424	3359	6637
J-88/MAC	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.7	76.2	75.7	75.8	78.9	70.3	3029	2976	5051
J90	4,700.00	3.5	7.0	3.6	7.1	4.3	8.6	84.2	82.9	83.2	82.5	86.0	77.0	1641	1621	1950
J92	4,700.00	3.5	7.0	3.6	7.1	4.3	8.6	84.0	82.9	83.0	82.5	85.9	77.0	3469	3414	5528
J94	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	81.0	79.9	80.0	79.4	82.9	73.9	2186	2156	2859
J96	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	80.7	79.6	79.6	79.1	82.6	73.6	2211	2180	2903
J98	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	80.4	79.4	79.4	78.9	82.4	73.4	2431	2396	3327
J-ALYSSUM	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	70.1	70.4	69.0	70.1	72.7	64.9			
J-AMBER	4,929.00	0.0	0.0	0.0	0.0	0.0	0.0	58.9	58.8	58.9	58.7	58.8	58.4	33913	33912	27165
J-AMBRTA	5,040.00	0.0	0.0	0.0	0.0	0.0	0.0	10.8	10.8	10.8	10.8	10.8	10.8			
J-AMBRTA	5,044.00	0.0	0.0	0.0	0.0	0.0	0.0	9.1	9.1	9.1	9.1	9.1	9.1			
J-ARB/MN	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	66.9	67.7	65.9	67.4	69.7	62.2			
J-ARB/MN	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	66.5	67.3	65.4	66.9	69.2	61.7	2775	2710	5785
J-ASPNGR\	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.4	74.9	75.0	78.1	69.4	3002	2949	5005
J-ASPNGR\	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	75.0	74.5	74.0	74.1	77.2	68.6	2865	2814	4640
J-ASTER	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	73.0	71.6	72.6	75.3	67.4			
J-AZALEA	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.1	73.4	72.1	73.1	75.7	67.9			
J-AZURE/B	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.6	68.4	66.5	68.1	70.4	63.1	2971	2904	6895
J-AZURE/C	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.5	68.4	66.5	68.1	70.4	63.1	3164	3089	8780
J-AZURE/F	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.5	68.4	66.5	68.0	70.3	63.0			
J-AZURE/G	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	68.4	69.3	67.4	69.0	71.3	64.0			
J-AZURE/L	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.5	68.3	66.4	67.9	70.3	62.9			
J-AZURE/M	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.4	68.2	66.3	67.8	70.1	62.7	3047	2976	7544
J-AZURE/M	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	67.7	68.5	66.6	68.1	70.4	63.0	3208	3130	9144
J-AZURE/M	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	67.7	68.5	66.7	68.2	70.5	63.0			
J-AZURE/S	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.4	68.2	66.3	67.8	70.2	62.7			
J-AZURE/T	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.4	68.3	66.4	67.9	70.2	62.8			
J-BEHIA/EI	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	74.9	74.5	73.9	74.1	77.1	68.6			
J-BELAR/1(	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	74.1	73.4	73.7	76.7	68.2	3392	3324	7077
J-BELAR/E-	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	73.1	72.8	72.1	72.4	75.4	66.9	1428	1408	1730

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-BELAR/LI	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.1	73.4	73.7	76.7	68.2			
J-BELAR/O	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.1	73.4	73.7	76.7	68.2	3269	3205	6346
J-BELSERA	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.6	68.4	66.5	68.1	70.4	63.1			
J-BENT01	4,810.00	3.5	7.0	3.6	7.1	4.3	8.6	110.6	110.0	110.6	109.9	110.3	108.3	6801	6800	6668
J-BENT02	4,810.00	3.5	7.0	3.6	7.1	4.3	8.6	110.6	110.0	110.6	109.9	110.3	108.3	6514	6513	6391
J-BENT03	4,810.00	3.5	7.0	3.6	7.1	4.3	8.6	110.6	110.0	110.6	109.9	110.3	108.3	6069	6068	5960
J-BENT04	4,810.00	3.5	7.0	3.6	7.1	4.3	8.6	110.6	110.0	110.6	109.9	110.3	108.3			
J-BENTPKV	4,801.00	3.5	7.0	3.6	7.1	4.3	8.6	114.5	113.9	114.5	113.8	114.2	112.2	6361	6360	6248
J-BENTPKV	4,795.00	3.5	7.0	3.6	7.1	4.3	8.6	117.1	116.5	117.1	116.4	116.7	114.8	7997	7996	7832
J-BENTPKV	4,781.00	3.5	7.0	3.6	7.1	4.3	8.6	123.1	122.6	123.1	122.5	122.8	120.9	12615	12614	11252
J-BENTPKV	4,795.00	3.5	7.0	3.6	7.1	4.3	8.6	117.1	116.5	117.1	116.4	116.7	114.8	7241	7240	7101
J-BLUSPRC	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.3	69.9	70.9	73.5	65.7	2434	2389	3889
J-BNTLYHE	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	70.4	70.3	69.4	69.9	72.6	64.6	3473	3393	9196
J-BNTLYHE	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	70.4	70.3	69.4	69.9	72.6	64.6			
J-BOUG/AS	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	73.5	73.8	72.4	73.4	76.1	68.2	3502	3428	8930
J-BOUG/CA	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.1	73.4	72.0	73.0	75.7	67.8	3481	3407	8927
J-BOUG/CA	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	70.1	70.5	69.1	70.2	72.7	65.0	3377	3300	9419
J-BOUG/FF	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	68.1	68.9	67.1	68.6	70.9	63.6			
J-BOUG/HC	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	73.5	73.7	72.4	73.4	76.0	68.2	3507	3433	8980
J-BOUG/M	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.6	68.2	69.2	71.8	64.1	3301	3225	9015
J-BOUG/SY	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	74.1	72.8	73.8	76.5	68.5	3532	3459	9032
J-BOUG/W	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	67.2	68.0	66.2	67.7	70.0	62.7			
J-BOUG/W	4,730.00	0.0	0.0	0.0	0.0	0.0	0.0	66.9	67.7	65.8	67.4	69.7	62.4			
J-BRCH	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	71.3	71.7	70.3	71.3	74.0	66.1	2069	2034	2955
J-BRCH/W	4,738.00	3.5	7.0	3.6	7.1	4.3	8.6	65.3	65.0	64.2	64.6	67.4	59.0			
J-BRSTLCN	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	80.3	79.3	79.3	78.9	82.3	73.4			
J-BUCK/BE	4,787.00	0.0	0.0	0.0	0.0	0.0	0.0	120.6	120.0	120.6	119.9	120.2	118.4	22187	22186	21300
J-BUCK/BC	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	68.1	68.9	67.0	68.6	70.9	63.6			
J-BUCK/BC	4,727.00	0.0	0.0	0.0	0.0	0.0	0.0	68.1	68.9	67.0	68.6	70.9	63.6			
J-BUCK/BC	4,727.00	0.0	0.0	0.0	0.0	0.0	0.0	68.0	68.9	67.0	68.6	70.9	63.6			
J-BUCK/BC	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	68.1	68.9	67.0	68.6	70.9	63.6			
J-BUCK/HE	4,730.00	0.0	0.0	0.0	0.0	0.0	0.0	66.6	67.5	65.5	67.2	69.5	62.3			
J-BUCK/HE	4,730.00	0.0	0.0	0.0	0.0	0.0	0.0	66.6	67.5	65.5	67.2	69.5	62.3			
J-BUCK/MI	4,782.00	0.0	0.0	0.0	0.0	0.0	0.0	122.7	122.1	122.7	122.0	122.3	120.4			
J-BUCK/OF	4,813.00	3.5	7.0	3.6	7.1	4.3	8.6	109.2	108.8	109.2	108.7	108.9	107.3			
J-BUCK/OF	4,813.00	0.0	0.0	0.0	0.0	0.0	0.0	109.2	108.8	109.2	108.7	108.9	107.3			
J-BUCK/OF	4,813.00	0.0	0.0	0.0	0.0	0.0	0.0	109.2	108.8	109.2	108.7	108.9	107.3	27269	27268	27036
J-BUCK/SA	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.6	67.7	65.5	67.3	69.5	62.5	3267	3185	12534
J-BUCK/VE	4,801.00	0.0	0.0	0.0	0.0	0.0	0.0	114.6	114.0	114.6	114.0	114.3	112.6			
J-BUCK/WI	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.1	127.5	125.4			
J-BUCK/WI	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	127.8	127.2	127.8	127.2	127.5	125.5			
J-BUCK/W	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	70.5	70.4	69.4	70.0	72.7	64.6	3630	3545	12211

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-BUCK/W	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	70.7	70.7	69.7	70.3	73.0	65.0	3623	3538	12082
J-BUCK01	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	73.2	71.7	72.8	75.3	67.7			
J-BUCK02	4,740.00	0.0	0.0	0.0	0.0	0.0	0.0	62.7	64.9	61.6	64.8	66.5	61.8			
J-BUCK03	4,740.00	0.0	0.0	0.0	0.0	0.0	0.0	62.3	63.3	61.2	63.0	65.3	58.3			
J-BUCK05	4,765.00	0.0	0.0	0.0	0.0	0.0	0.0	130.0	129.4	130.0	129.3	129.6	127.6			
J-BUCK06	4,785.00	0.0	0.0	0.0	0.0	0.0	0.0	121.4	120.8	121.4	120.7	121.1	119.2			
J-BUCK07	4,785.00	0.0	0.0	0.0	0.0	0.0	0.0	121.3	120.8	121.3	120.7	121.0	119.2			
J-BUCK08	4,830.00	0.0	0.0	0.0	0.0	0.0	0.0	101.8	101.4	101.8	101.4	101.6	100.2	28242	28241	27488
J-BUCK09	4,836.00	0.0	0.0	0.0	0.0	0.0	0.0	99.2	98.9	99.2	98.8	99.0	97.7	28429	28429	27487
J-BUCK10	4,866.00	0.0	0.0	0.0	0.0	0.0	0.0	86.2	85.9	86.2	85.9	86.0	85.0	29160	29160	27810
J-BUCK11	4,765.00	3.5	7.0	3.6	7.1	4.3	8.6	130.0	129.4	130.0	129.3	129.6	127.6			
J-BUCK12	4,765.00	3.5	7.0	3.6	7.1	4.3	8.6	130.0	129.4	130.0	129.3	129.6	127.6	3362	3361	3331
J-BUCK13	4,765.00	3.5	7.0	3.6	7.1	4.3	8.6	130.0	129.4	130.0	129.3	129.6	127.6	7029	7029	6494
J-BUCK14	4,765.00	3.5	7.0	3.6	7.1	4.3	8.6	130.0	129.4	130.0	129.3	129.6	127.6	3888	3888	3848
J-BURR/EN	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.4	74.9	74.3	74.5	77.6	69.0			
J-BURR/LA	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.4	74.9	74.3	74.5	77.6	69.0	2312	2274	3256
J-C.ALLEY/	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	71.5	70.7	71.1	74.0	65.7			
J-C.ALLEY/	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.4	68.2	67.3	67.8	70.5	62.2	2655	2600	4718
J-C.ALLEY/	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.0	68.2	68.6	71.4	63.1			
J-C.ALLEY/	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.6	69.5	68.6	69.1	71.8	63.6	2390	2346	3725
J-C.ALLEY/	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.6	62.4			
J-C.ALLEY/	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.6	62.4			
J-C.ALLEY/	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.6	62.4			
J-C.ALLEY/	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.5	69.3	68.4	68.9	71.7	63.5			
J-C.ALLEY/	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	70.6	70.4	69.6	70.1	72.9	64.6			
J-CAMELLI	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.2	72.5	71.2	72.2	74.8	67.0			
J-CANT/AL	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	70.1	70.4	69.0	70.1	72.7	64.9	2776	2720	5150
J-CANT/DA	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.8	72.1	70.7	71.7	74.4	66.5			
J-CANT/EV	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.3	69.9	70.9	73.5	65.7			
J-CANT/LIN	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.2	72.5	71.2	72.2	74.8	67.0			
J-CANT/TU	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.3	69.9	71.0	73.6	65.8	2924	2865	5695
J-CARVAL	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.4	75.0	74.3	74.6	77.6	69.1	1405	1386	1680
J-CDR/ASH	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.0	73.3	72.0	72.9	75.6	67.7	3043	2983	5916
J-CDR/WH	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	72.0	70.7	71.6	74.3	66.4	2912	2855	5505
J-CDR/WH	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	72.6	72.9	71.5	72.5	75.2	67.3			
J-CDRWD	4,703.00	3.5	7.0	3.6	7.1	4.3	8.6	82.7	81.5	81.6	81.0	84.5	75.5	2351	2317	3127
J-CDRWDC	4,703.00	3.5	7.0	3.6	7.1	4.3	8.6	82.7	81.5	81.6	81.0	84.5	75.5			
J-CLVR	4,698.00	3.5	7.0	3.6	7.1	4.3	8.6	85.3	84.1	84.3	83.7	87.1	78.2			
J-CODGAR	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	69.5	69.4	68.5	69.0	71.7	63.7	2064	2029	2953
J-CONIF/PI	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	73.4	73.7	72.4	73.4	76.0	68.1			
J-CONIF/PI	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	72.6	72.9	71.5	72.5	75.2	67.3			
J-CONIF/W	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	72.0	70.7	71.6	74.3	66.4	2449	2404	3871

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-CR/10TH	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	72.3	72.0	71.2	71.6	74.5	66.2	3757	3672	12598
J-CR/1ST	4,738.00	3.5	7.0	3.6	7.1	4.3	8.6	65.4	65.1	64.3	64.7	67.4	59.0	2797	2728	6440
J-CR/2ND	4,734.00	3.5	7.0	3.6	7.1	4.3	8.6	67.1	66.9	66.1	66.5	69.2	60.8			
J-CR/395	4,738.00	3.5	7.0	3.6	7.1	4.3	8.6	65.4	65.1	64.3	64.7	67.4	59.0	1999	1959	2987
J-CR/3RD	4,734.00	3.5	7.0	3.6	7.1	4.3	8.6	67.1	66.9	66.1	66.5	69.2	61.0	2950	2882	6454
J-CR/5TH	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	68.9	68.8	67.9	68.4	71.1	63.0	3541	3456	11698
J-CR/6TH	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.7	69.5	68.7	69.1	71.9	63.8			
J-CR/7TH	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	71.5	70.7	71.1	73.9	65.7	3244	3177	6891
J-CR/8TH	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	72.0	71.8	70.9	71.4	74.2	66.0	3322	3253	7307
J-CR/CARV	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.1	73.4	73.7	76.7	68.2	3080	3022	5533
J-CR/E-ENI	4,742.00	3.5	7.0	3.6	7.1	4.3	8.6	63.6	63.4	62.6	63.0	65.7	57.3			
J-CR/LIB	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.8	76.2	75.7	75.8	78.9	70.3	2972	2921	4848
J-CR/LUCE	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.1	73.7	73.0	73.3	76.3	67.9	3306	3241	6665
J-CR/OULA	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.3	74.9	74.3	74.5	77.5	69.0			
J-CR/WELL	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	69.0	68.8	67.9	68.4	71.2	63.0			
J-CR/WELL	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	73.7	73.5	72.7	73.1	76.0	67.7			
J-CRDWD	4,701.00	3.5	7.0	3.6	7.1	4.3	8.6	83.5	82.3	82.5	81.9	85.4	76.4	1736	1715	2093
J-CVI01	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.2	70.4	70.8	73.7	65.4	3110	3046	6243
J-CVI02	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	70.1	69.9	69.0	69.5	72.4	64.1			
J-CVMED0	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	77.1	76.9	76.1	76.4	79.4	71.0	3590	3521	7612
J-CVMED0	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	77.1	76.9	76.1	76.4	79.4	71.0	3537	3470	7299
J-CVMED0	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	77.1	76.9	76.1	76.4	79.4	71.0			
J-DAPH	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.8	72.1	70.7	71.7	74.4	66.5	2626	2577	4421
J-DES/2ND	4,732.00	3.5	7.0	3.6	7.1	4.3	8.6	67.9	67.6	66.8	67.2	70.0	61.6	1817	1785	2474
J-DES/BRC	4,735.00	3.5	7.0	3.6	7.1	4.3	8.6	66.6	66.3	65.5	65.9	68.7	60.3	1666	1636	2210
J-DES/S-EN	4,739.00	3.5	7.0	3.6	7.1	4.3	8.6	64.9	64.6	63.8	64.2	67.0	58.5	1489	1463	1921
J-DES/W-E	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.6	69.3	68.6	68.9	71.7	63.3	1659	1631	2147
J-DHS01	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.1	76.5	76.0	76.1	79.3	70.6	3294	3234	5920
J-DHS02	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.7	76.1	75.6	75.7	78.8	70.1			
J-DHS03	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.1	75.6	75.1	75.2	78.3	69.7	3620	3548	7726
J-DHS04	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.1	75.6	75.1	75.2	78.3	69.6			
J-DHS05	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.1	75.6	75.1	75.2	78.3	69.7			
J-DHS06	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.6	76.0	75.5	75.6	78.7	70.1			
J-DHS07	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.0	76.5	76.0	76.0	79.2	70.5	2868	2819	4558
J-DHS08	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	74.9	74.3	73.8	73.9	77.0	68.4			
J-DHS09	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.6	76.0	75.5	75.6	78.7	70.1	2697	2652	4118
J-DHS10	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.6	76.0	75.5	75.6	78.8	70.1			
J-E.VLY/AN	4,884.00	0.0	0.0	0.0	0.0	0.0	0.0	78.4	78.2	78.4	78.1	78.3	77.5	32173	32173	30823
J-ESM/10T	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.2	71.0	70.2	70.6	73.5	65.2			
J-ESM/10T	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.2	71.0	70.2	70.6	73.5	65.2	2909	2852	5322
J-ESM/3RI	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.5	62.3	2595	2542	4465
J-ESM/4TH	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.6	69.5	68.6	69.1	71.8	63.7	3023	2958	6137

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-ESM/5TH	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.0	68.1	68.7	71.4	63.2	3089	3022	6610
J-ESM/6TH	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	70.0	69.9	69.0	69.5	72.3	64.1	3608	3523	12112
J-ESM/7TH	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	70.3	70.2	69.3	69.8	72.6	64.4	2941	2882	5601
J-ESM/8TH	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	71.3	70.4	70.9	73.7	65.5	3088	3026	6104
J-ESM/9TH	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	70.8	70.6	69.7	70.2	73.1	64.8	2575	2527	4181
J-ESM/W-E	4,725.00	3.5	7.0	3.6	7.1	4.3	8.6	70.3	70.1	69.3	69.7	72.6	64.3			
J-EVRGRN	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.3	69.9	70.9	73.5	65.7	2550	2502	4240
J-FIORE	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.5	68.4	66.5	68.0	70.3	63.0			
J-FIRTREE	4,701.00	3.5	7.0	3.6	7.1	4.3	8.6	84.0	82.8	83.0	82.4	85.8	76.9	1464	1447	1704
J-FONTE	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.6	68.5	66.6	68.2	70.5	63.2			
J-FOXGLV	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.8	72.1	70.7	71.7	74.4	66.5	2108	2072	3027
J-FREIDA/V	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.0	72.8	70.9	72.5	74.8	67.5	1736	1709	2293
J-FXTL	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	80.0	79.0	79.0	78.6	82.0	73.0			
J-GAL/FNT	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.6	68.5	66.6	68.2	70.5	63.2			
J-GAL/ROS	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	67.2	68.1	66.2	67.8	70.1	62.8			
J-GILMAN/	4,755.00	3.5	7.0	3.6	7.1	4.3	8.6	58.0	57.7	56.9	57.2	59.7	51.0			
J-GILMAN/	4,755.00	3.5	7.0	3.6	7.1	4.3	8.6	58.0	57.7	56.9	57.2	59.7	51.0			
J-GILMAN/	4,756.00	3.5	7.0	3.6	7.1	4.3	8.6	57.6	57.3	56.5	56.8	59.3	50.6			
J-HDNBRK	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.2	72.4	71.2	72.1	74.8	66.8	2320	2279	3492
J-HEARTH(	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	72.6	72.4	71.6	72.0	74.9	66.6	2438	2396	3698
J-HEARTH(	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.1	72.2	72.7	75.5	67.3	3467	3395	8177
J-HEARTH(	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	72.6	71.7	72.2	75.1	66.8	3316	3248	7203
J-HEARTH(	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	74.3	73.4	73.9	76.8	68.5			
J-HEARTH(	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	74.3	73.3	73.9	76.8	68.5	3694	3617	9948
J-HEARTH(	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	70.6	70.6	69.6	70.2	73.0	64.8			
J-HEARTH(	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	71.5	71.5	70.5	71.1	73.9	65.7	2983	2923	5663
J-HEARTH(	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	73.4	73.4	72.4	73.0	75.8	67.6	3471	3399	8167
J-HEARTH(	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.2	72.2	72.8	75.6	67.4	3402	3332	7736
J-HEARTH1	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.4	72.3	71.3	71.9	74.8	66.5			
J-HEATHEF	4,700.00	3.5	7.0	3.6	7.1	4.3	8.6	84.1	82.9	83.1	82.4	86.0	76.9	1461	1444	1697
J-HEY/CHA	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.6	68.4	66.5	68.1	70.4	63.1			
J-HEY/E-EN	4,754.00	3.5	7.0	3.6	7.1	4.3	8.6	58.4	58.1	57.4	57.7	60.1	51.5			
J-HEY/EXP(	4,725.00	0.0	0.0	0.0	0.0	0.0	0.0	66.4	66.9	65.4	66.6	69.1	61.4			
J-HEY/GILM	4,752.00	3.5	7.0	3.6	7.1	4.3	8.6	59.3	59.0	58.2	58.5	61.0	52.3			
J-HEY/LASS	4,747.00	3.5	7.0	3.6	7.1	4.3	8.6	61.4	61.2	60.4	60.7	63.2	54.5	1793	1749	3032
J-HEY/MOI	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	67.5	68.3	66.5	67.9	70.3	62.9			
J-HEY/MOI	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	67.5	68.2	66.4	67.9	70.3	62.8			
J-HEY/N-EI	4,722.00	10000.0	10000.0	10000.0	10000.0	10000.0	10000.0	67.7	68.2	66.6	67.8	70.4	62.7			
J-HEY/SNA	4,745.00	3.5	7.0	3.6	7.1	4.3	8.6	62.3	62.0	61.3	61.6	64.0	55.4			
J-HEY/SNA	4,747.00	3.5	7.0	3.6	7.1	4.3	8.6	61.4	61.2	60.4	60.7	63.2	54.5	1819	1774	3126
J-HEY/WEL	4,722.00	0.0	0.0	0.0	0.0	0.0	0.0	68.4	68.9	67.3	68.6	71.1	63.4			
J-HEY/WEL	4,722.00	0.0	0.0	0.0	0.0	0.0	0.0	67.7	68.2	66.7	67.9	70.4	62.7			

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-HEY/WEL	4,722.00	0.0	0.0	0.0	0.0	0.0	0.0	67.7	68.2	66.7	67.9	70.4	62.7			
J-HWY880	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	73.9	73.4	73.5	76.6	67.9	3459	3389	7195
J-HWY880	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	73.9	73.3	73.4	76.6	67.9			
J-HWY880	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	73.9	73.3	73.4	76.6	67.9	3439	3369	7158
J-HWY880	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	75.6	75.1	74.6	74.7	77.8	69.2	3203	3143	5848
J-IRIS	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	72.6	72.9	71.6	72.5	75.2	67.3			
J-IRNWD/C	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	77.6	77.3	76.5	76.9	79.8	71.4	3766	3692	8689
J-IRNWD/E	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.8	72.8	71.7	72.4	75.2	67.0			
J-IRNWD/I	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.8	72.8	71.7	72.4	75.2	67.0			
J-IRNWD/I	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.7	73.6	72.6	73.2	76.1	67.8			
J-IRNWD/I	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.7	73.6	72.6	73.2	76.1	67.9			
J-IRNWD/M	4,709.00	3.5	7.0	3.6	7.1	4.3	8.6	76.4	76.3	75.4	75.9	78.8	70.5			
J-IRNWD/P	4,702.00	3.5	7.0	3.6	7.1	4.3	8.6	82.3	81.4	81.3	81.0	84.3	75.5	2432	2398	3272
J-IRNWD/P	4,702.00	3.5	7.0	3.6	7.1	4.3	8.6	82.3	81.4	81.3	81.0	84.3	75.5			
J-IRNWD/P	4,703.00	3.5	7.0	3.6	7.1	4.3	8.6	81.9	81.0	80.8	80.5	83.9	75.1			
J-IRNWD01	4,698.00	3.5	7.0	3.6	7.1	4.3	8.6	85.2	84.1	84.2	83.7	87.1	78.2	3492	3438	5481
J-IRNWD02	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	77.7	77.4	76.6	76.9	79.9	71.5	3792	3721	8782
J-IRNWD03	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	78.1	77.8	77.0	77.4	80.4	71.9	3808	3737	8781
J-IRNWD04	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	77.5	77.3	76.4	76.8	79.8	71.4	3771	3696	8809
J-IRNWDC	4,698.00	3.5	7.0	3.6	7.1	4.3	8.6	85.2	84.1	84.2	83.7	87.1	78.2			
J-JCTCOMM	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.4	72.9	73.0	76.1	67.5			
J-JCTCOMM	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	73.4	72.9	73.0	76.1	67.5			
J-JCTCOMM	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	73.4	72.9	72.4	72.5	75.6	67.0			
J-JCTCOMM	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	73.4	72.9	72.4	72.5	75.6	67.0	3308	3241	6721
J-JCTCOMM	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.8	73.3	72.7	72.9	76.0	67.4	3284	3218	6551
J-JCTCOMM	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	74.6	74.2	73.6	73.7	76.8	68.3			
J-LABA/BE	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	74.9	74.5	73.9	74.1	77.1	68.6	2341	2302	3336
J-LABA/E-E	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	73.6	73.0	73.2	76.3	67.7			
J-LABA/OL	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	73.6	73.0	73.2	76.3	67.7			
J-LANT/BO	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	74.3	74.5	73.2	74.2	76.8	68.9	3588	3513	9399
J-LANT/BO	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	70.2	70.7	69.1	70.4	72.9	65.3	3475	3394	10961
J-LANT/N-I	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	73.1	71.6	72.7	75.3	67.5	3688	3605	12774
J-LANT/VE	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.3	72.6	71.2	72.3	74.9	67.1	3494	3418	9480
J-LANT/WI	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	74.2	72.9	73.8	76.5	68.5	3597	3521	9646
J-LANT/WI	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	74.6	73.3	74.3	77.0	69.0	3647	3571	9966
J-LASSO/W	4,744.00	3.5	7.0	3.6	7.1	4.3	8.6	62.7	62.5	61.7	62.0	64.5	55.8			
J-LASSO01	4,747.00	3.5	7.0	3.6	7.1	4.3	8.6	61.4	61.2	60.4	60.7	63.2	54.5			
J-LAV	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.3	69.9	71.0	73.6	65.8	2449	2403	3931
J-LAV/S-EN	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.3	69.9	71.0	73.6	65.8			
J-LIBRARY	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.6	74.1	73.6	73.7	76.8	68.1			
J-LILAC	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	73.5	73.7	72.4	73.4	76.0	68.1			
J-LIND	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.2	69.9	70.9	73.5	65.7	2523	2476	4155

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-LIND/BR(	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.8	72.1	70.7	71.7	74.4	66.5			
J-LIND/N-E	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	71.3	71.7	70.3	71.3	74.0	66.1	2083	2047	2984
J-LNGLF01	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	79.4	78.4	78.3	77.9	81.3	72.4	2291	2258	3073
J-LRCHWD	4,704.00	3.5	7.0	3.6	7.1	4.3	8.6	81.6	80.5	80.5	80.1	83.5	74.6	1618	1598	1930
J-LUCE/FIR	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.7	75.7	74.7	75.3	78.2	70.0			
J-LUCE/FIR	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.7	75.7	74.7	75.3	78.2	70.0			
J-LUCE/FIR	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.6	73.6	72.6	73.2	76.0	67.8	3772	3690	12007
J-LUCE/HD	4,712.00	0.0	0.0	0.0	0.0	0.0	0.0	74.4	74.5	73.4	74.2	76.9	68.8			
J-LUCE/HD	4,712.00	0.0	0.0	0.0	0.0	0.0	0.0	74.4	74.5	73.4	74.2	76.9	68.8			
J-LUCE/HD	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	74.6	73.3	74.2	76.9	69.0	3679	3601	10292
J-LUCE/HE	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	72.6	71.6	72.2	75.0	66.8			
J-LUCE/HE	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	72.6	71.6	72.2	75.0	66.8	3739	3655	12148
J-LUCE/IRN	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	75.0	74.9	73.9	74.5	77.4	69.2			
J-LUCE/IRN	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	75.0	74.9	73.9	74.5	77.4	69.2	3904	3820	13097
J-LUCE/LAI	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	74.4	74.6	73.3	74.2	76.9	69.0			
J-LUCE/MV	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.6	73.4	74.2	77.0	68.9	3832	3750	12360
J-LUCE/S-E	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.1	72.2	72.7	75.6	67.3	3513	3439	8598
J-LUCE01	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	72.1	72.0	71.1	71.6	74.5	66.2	3737	3651	12758
J-LUCE02	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	70.3	70.2	69.3	69.8	72.7	64.4			
J-LUCE03	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	70.3	70.2	69.3	69.8	72.7	64.4			
J-LUCE04	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.1	72.2	72.7	75.6	67.3			
J-LUCE05	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.1	72.2	72.7	75.6	67.3			
J-LUCE06	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	71.9	71.8	70.8	71.4	74.2	66.0	3681	3597	11877
J-LUCE07	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	74.7	74.6	73.6	74.2	77.1	68.8			
J-LUCE08	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.2	73.1	72.2	72.7	75.6	67.3	2857	2804	4933
J-LUPINE	4,696.00	3.5	7.0	3.6	7.1	4.3	8.6	85.8	84.5	84.8	84.1	87.6	78.6	1548	1530	1808
J-MACK/1(	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	72.4	71.7	71.9	75.0	66.5			
J-MACK/BL	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	76.7	76.2	75.6	75.8	78.9	70.3	3046	2992	5141
J-MACK/E-	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	72.7	72.4	71.7	71.9	75.0	66.5			
J-MACK/LL	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	75.8	75.4	74.7	75.0	78.0	69.5	3274	3212	6187
J-MACK/OI	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	75.8	75.4	74.7	75.0	78.0	69.5	3244	3183	6028
J-MAHO/B	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	80.3	79.3	79.3	78.9	82.3	73.4	3250	3196	5354
J-MAHO/C	4,694.00	3.5	7.0	3.6	7.1	4.3	8.6	86.6	85.4	85.6	85.0	88.5	79.5	2827	2787	3950
J-MAHO/F	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	80.0	79.0	79.0	78.6	82.0	73.0	3222	3168	5289
J-MAHO/IF	4,699.00	3.5	7.0	3.6	7.1	4.3	8.6	84.4	83.3	83.4	82.9	86.3	77.4	3541	3484	5726
J-MAHO/L	4,702.00	3.5	7.0	3.6	7.1	4.3	8.6	82.4	81.4	81.4	80.9	84.4	75.4			
J-MAHO/LI	4,705.00	3.5	7.0	3.6	7.1	4.3	8.6	80.6	79.6	79.6	79.2	82.6	73.7	3340	3284	5623
J-MAHO/LI	4,694.00	3.5	7.0	3.6	7.1	4.3	8.6	86.6	85.4	85.6	85.0	88.5	79.5			
J-MAHO/T	4,699.00	3.5	7.0	3.6	7.1	4.3	8.6	84.5	83.3	83.5	82.8	86.4	77.3	1912	1888	2357
J-MAHO/W	4,700.00	3.5	7.0	3.6	7.1	4.3	8.6	83.8	82.7	82.7	82.2	85.7	76.7	3662	3600	6214
J-MAHO/W	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	80.2	79.3	79.2	78.8	82.2	73.3			
J-MAHO/W	4,694.00	3.5	7.0	3.6	7.1	4.3	8.6	86.6	85.4	85.6	85.0	88.5	79.5			

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-MAHO01	4,712.00	3.5	7.0	3.6	7.1	4.3	8.6	76.7	76.0	75.7	75.6	78.8	70.1	3330	3270	6023
J-MAHO02	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	77.3	76.5	76.2	76.1	79.4	70.6	3308	3249	5861
J-MAHOCI	4,701.00	3.5	7.0	3.6	7.1	4.3	8.6	83.6	82.4	82.6	82.0	85.5	76.4	1680	1659	2009
J-MAHOLN	4,704.00	3.5	7.0	3.6	7.1	4.3	8.6	81.4	80.4	80.4	80.0	83.4	74.4	3309	3254	5431
J-MARIGOI	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	74.2	72.9	73.8	76.5	68.6			
J-MES01	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.3	67.3	65.3	66.9	69.2	61.9			
J-MES02	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.3	67.3	65.3	66.9	69.2	61.9	2562	2506	4816
J-MES03	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.3	67.3	65.3	66.9	69.2	61.9	2392	2342	4150
J-MES04	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.3	67.3	65.3	66.9	69.2	61.9	2308	2261	3864
J-MGSD-EI	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	80.2	79.3	79.2	78.8	82.2	73.4	1276	1261	1468
J-MNDNTC	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.8	73.3	72.7	72.9	76.0	67.4			
J-MNDNTC	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	73.8	73.3	72.7	72.9	76.0	67.4	3052	2993	5495
J-MNDNTC	4,719.00	3.5	7.0	3.6	7.1	4.3	8.6	72.9	72.5	71.9	72.0	75.1	66.5	1589	1565	1978
J-MNDNTC	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	73.3	72.9	72.3	72.5	75.5	67.0			
J-MNDNTC	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.1	74.6	74.0	74.2	77.3	68.7	2387	2347	3440
J-MNTRRA	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	67.7	68.5	66.7	68.2	70.5	63.0			
J-MNTRRA	4,733.00	3.5	7.0	3.6	7.1	4.3	8.6	64.8	65.6	63.7	65.2	67.5	60.0			
J-MONO/1	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.8	71.5	70.7	71.1	74.0	65.7	3030	2970	5761
J-MONO/2	4,735.00	3.5	7.0	3.6	7.1	4.3	8.6	66.6	66.4	65.6	66.0	68.8	60.5	2586	2530	4670
J-MONO/3	4,740.00	3.5	7.0	3.6	7.1	4.3	8.6	64.5	64.3	63.4	63.9	66.5	58.1	2590	2528	5256
J-MONO/3	4,738.00	3.5	7.0	3.6	7.1	4.3	8.6	65.4	65.1	64.3	64.7	67.4	59.0			
J-MONO/3	4,734.00	3.5	7.0	3.6	7.1	4.3	8.6	67.1	66.9	66.0	66.4	69.1	60.7	2826	2760	6418
J-MONO/3	4,735.00	3.5	7.0	3.6	7.1	4.3	8.6	66.7	66.5	65.6	66.1	68.8	60.5	2842	2777	5860
J-MONO/5	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.4	68.2	67.3	67.8	70.6	62.4	3102	3032	6886
J-MONO/6	4,734.00	3.5	7.0	3.6	7.1	4.3	8.6	67.0	66.9	66.0	66.5	69.3	61.1	3416	3330	11644
J-MONO/8	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	71.1	70.9	70.0	70.5	73.3	65.1	3182	3116	6684
J-MONTI	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	68.0	68.9	67.0	68.6	70.9	63.6			
J-MV/N-BC	4,712.00	0.0	0.0	0.0	0.0	0.0	0.0	73.1	73.5	72.1	73.2	75.8	67.9			
J-MV/N-EI	4,708.00			2.2	4.3	8.3	16.6			75.8	76.3	79.2	70.7			
J-MV01	4,710.00	0.0	0.0	0.0	0.0	0.0	0.0	76.0	75.8	74.9	75.4	78.3	70.0	3261	3201	6180
J-MV02	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	75.5	75.4	74.5	75.0	77.8	69.5	3259	3212	6308
J-MV03	4,709.00	3.5	7.0	3.6	7.1	4.3	8.6	76.5	76.3	75.4	75.8	78.7	70.3	3344	3300	6585
J-MV04	4,710.00			2.2	4.3	8.3	16.6			75.0	75.4	78.3	69.9		3009	5365
J-MV05	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.7	74.9	75.3	78.2	69.8	3295	3268	6540
J-MV06	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.7	74.9	75.3	78.2	69.8	3189	3190	6147
J-MV07	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.7	75.6	74.7	75.3	78.1	69.8	3342	3331	6932
J-MV08	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.8	74.9	75.4	78.2	69.8			
J-MV09	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	75.4	75.3	74.5	74.9	77.8	69.4	3124	3201	6259
J-MV10	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.8	74.9	75.4	78.2	69.8	3198	3267	6510
J-MV11	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	75.9	75.7	74.9	75.4	78.2	69.8	3063	3237	6363
J-MV12	4,711.00	3.5	7.0	3.6	7.1	4.3	8.6	75.4	75.3	74.4	74.9	77.8	69.4	2930	3124	5914
J-MV13	4,709.00			2.2	4.3	8.3	16.6			75.3	75.8	78.7	70.3			

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-MV14	4,710.00			2.2	4.3	8.3	16.6			74.9	75.4	78.2	69.8			
J-MV15	4,713.00			2.2	4.3	8.3	16.6			73.6	74.1	76.9	68.5			
J-MV16	4,713.00			2.2	4.3	8.3	16.6			73.6	74.1	77.0	68.5		3059	5733
J-N.ALLEY/	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	72.0	71.8	70.9	71.4	74.3	66.0			
J-N.ALLEY/	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	69.0	68.1	68.6	71.4	63.2	3027	2962	6252
J-N.ALLEY/	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	68.3	68.2	67.3	67.8	70.5	62.4	3086	3017	6830
J-N.ALLEY/	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	69.6	69.5	68.6	69.1	71.8	63.7			
J-N.ALLEY/	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	69.9	69.7	68.8	69.3	72.1	63.9			
J-N.ALLEY/	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.3	70.4	70.9	73.7	65.4			
J-N.ALLEY/	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.4	71.3	70.4	70.9	73.7	65.5			
J-N.ALLEY/	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	70.8	70.6	69.7	70.2	73.1	64.8			
J-N.ALLEY/	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	70.8	70.6	69.7	70.2	73.1	64.7	2963	2903	5617
J-N.ALLEY/	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	70.7	70.4	69.6	70.0	73.0	64.6			
J-N.ALLEYC	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	71.5	70.7	71.1	74.0	65.7	2671	2621	4412
J-N.ALLEYC	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	70.2	70.0	69.2	69.6	72.5	64.2			
J-N-BOUNI	4,709.00	3.4	6.9	2.2	4.3	8.3	16.6	76.7	76.4	75.5	75.9	78.8	70.4	3350	3376	6947
J-N-BOUNI	4,705.00	3.5	7.0	3.6	7.1	4.3	8.6	78.5	78.2	77.3	77.7	80.6	72.2	3486	3490	7164
J-OAKWD/	4,702.00	3.5	7.0	3.6	7.1	4.3	8.6	82.9	81.7	81.8	81.3	84.8	75.8	2761	2720	3952
J-OAKWDC	4,699.00	3.5	7.0	3.6	7.1	4.3	8.6	84.2	83.1	83.2	82.6	86.1	77.1			
J-ORCH01	4,810.00	3.5	7.0	3.6	7.1	4.3	8.6	110.6	110.0	110.6	109.9	110.3	108.3			
J-ORCH02	4,809.00	3.5	7.0	3.6	7.1	4.3	8.6	111.0	110.4	111.0	110.3	110.7	108.8			
J-OXYOKE/	4,751.00	3.5	7.0	3.6	7.1	4.3	8.6	59.7	59.4	58.7	59.0	61.4	52.8	1654	1613	2667
J-OXYOKE/	4,754.00	3.5	7.0	3.6	7.1	4.3	8.6	58.4	58.1	57.4	57.7	60.1	51.5	1449	1414	2142
J-PINION	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.8	71.1	69.8	70.8	73.4	65.5	2773	2718	5025
J-PNWD01	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	79.1	78.4	78.0	78.0	81.2	72.5	3499	3437	6456
J-PNWD02	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	79.0	78.4	78.0	78.0	81.1	72.4	3512	3450	6521
J-PNWD03	4,709.00	3.5	7.0	3.6	7.1	4.3	8.6	77.7	77.1	76.6	76.6	79.8	71.1	3260	3203	5706
J-ROSSO	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	67.2	68.1	66.2	67.8	70.1	62.8			
J-S.ALLEY/:	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	71.5	70.7	71.1	74.0	65.7			
J-S.ALLEY/:	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.8	71.5	70.7	71.1	74.0	65.7			
J-S.ALLEY/:	4,735.00	3.5	7.0	3.6	7.1	4.3	8.6	66.7	66.4	65.6	66.0	68.7	60.3			
J-S.ALLEY/:	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	68.9	68.7	67.8	68.2	71.0	62.7	3153	3080	7569
J-S.ALLEY/S	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	68.9	68.8	67.9	68.4	71.1	63.0			
J-S.ALLEY/(	4,735.00	3.5	7.0	3.6	7.1	4.3	8.6	66.4	66.3	65.4	65.9	68.7	60.5			
J-S.ALLEY/(	4,735.00	3.5	7.0	3.6	7.1	4.3	8.6	66.6	66.5	65.6	66.1	68.8	60.7			
J-S.ALLEY/(	4,734.00	3.5	7.0	3.6	7.1	4.3	8.6	67.1	66.9	66.0	66.5	69.3	61.1	3382	3298	10703
J-S.ALLEY/S	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	70.2	70.0	69.2	69.6	72.5	64.2			
J-S.ALLEY/\	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	69.0	68.8	68.0	68.4	71.2	63.0			
J-SANF/BA	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.3	67.3	65.3	66.9	69.2	62.0			
J-SANF/CH	4,731.00	3.5	7.0	3.6	7.1	4.3	8.6	65.8	66.7	64.8	66.4	68.7	61.3			
J-SANF/GA	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	66.8	67.8	65.8	67.4	69.7	62.5			
J-SANF/LA:	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	66.2	67.0	65.1	66.6	69.0	61.6			

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-SANF/MI	4,728.00	3.5	7.0	3.6	7.1	4.3	8.6	66.9	67.8	65.9	67.4	69.7	62.2			
J-SANF/MI	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.3	68.1	66.3	67.8	70.1	62.6			
J-SHMRK	4,703.00	3.5	7.0	3.6	7.1	4.3	8.6	82.9	81.6	81.9	81.2	84.7	75.7	1347	1331	1549
J-SIENNA	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.4	68.2	66.3	67.8	70.2	62.7			
J-SNAFFLE/	4,744.00	3.5	7.0	3.6	7.1	4.3	8.6	62.7	62.5	61.7	62.0	64.5	55.8			
J-SNAFFLE/	4,745.00	3.5	7.0	3.6	7.1	4.3	8.6	62.3	62.0	61.3	61.6	64.0	55.4			
J-SNAFFLE/	4,745.00	3.5	7.0	3.6	7.1	4.3	8.6	62.3	62.0	61.3	61.6	64.0	55.4			
J-SP01	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.5			
J-SP02	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP03	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP04	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	3578	3578	3543
J-SP05	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP06	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP07	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP08	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP09	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP10	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP11	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP12	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP13	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP14	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	6167	6166	6064
J-SP15	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	4200	4199	4150
J-SP16	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	6543	6542	6428
J-SP17	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP18	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP19	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	8535	8535	7746
J-SP20	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP21	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP22	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	5698	5698	5612
J-SP23	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP24	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	1809	1809	1799
J-SP25	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4			
J-SP26	4,815.00	3.5	7.0	3.6	7.1	4.3	8.6	108.4	107.9	108.4	107.8	108.1	106.4	5452	5451	5372
J-SP27	4,790.00	3.5	7.0	3.6	7.1	4.3	8.6	119.2	118.6	119.2	118.6	118.9	116.9	4931	4931	4867
J-SP28	4,789.00	3.5	7.0	3.6	7.1	4.3	8.6	119.7	119.1	119.7	119.0	119.3	117.4	4721	4721	4661
J-SP29	4,788.00	3.5	7.0	3.6	7.1	4.3	8.6	120.1	119.5	120.1	119.4	119.7	117.8	4454	4454	4401
J-SPRCE	4,739.00	3.5	7.0	3.6	7.1	4.3	8.6	64.9	64.6	63.8	64.2	67.0	58.5			
J-SPRCE/LC	4,736.00	0.0	0.0	0.0	0.0	0.0	0.0	66.2	65.9	65.1	65.4	68.3	59.8			
J-SPRCE/LC	4,732.00	0.0	0.0	0.0	0.0	0.0	0.0	67.9	67.6	66.8	67.2	70.0	61.6			
J-SYC/CON	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.1	72.4	71.1	72.1	74.7	66.8			
J-TAM/FIR	4,697.00	3.5	7.0	3.6	7.1	4.3	8.6	85.7	84.5	84.7	84.1	87.6	78.7			
J-TAM/HE/	4,700.00	3.5	7.0	3.6	7.1	4.3	8.6	84.1	82.9	83.1	82.4	86.0	76.9	2032	2006	2552

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-TAM/IRN	4,697.00	3.5	7.0	3.6	7.1	4.3	8.6	86.0	84.9	85.0	84.5	87.9	79.2	4100	4035	7080
J-TAM/MA	4,699.00	3.5	7.0	3.6	7.1	4.3	8.6	84.5	83.3	83.5	82.8	86.4	77.3			
J-TAM/OA	4,701.00	3.5	7.0	3.6	7.1	4.3	8.6	83.8	82.8	82.8	82.4	85.7	77.0	4088	4020	7409
J-TAM/PN	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	79.7	79.0	78.7	78.6	81.8	73.1	3877	3808	7876
J-TAM/WE	4,696.00	3.5	7.0	3.6	7.1	4.3	8.6	86.7	85.7	85.7	85.2	88.6	79.9			
J-TAM/WS	4,697.00	3.5	7.0	3.6	7.1	4.3	8.6	85.5	84.2	84.5	83.8	87.3	78.3	2438	2405	3226
J-TSCN	4,727.00	3.5	7.0	3.6	7.1	4.3	8.6	67.4	68.3	66.4	67.9	70.2	62.8			
J-TULIP	4,720.00	3.5	7.0	3.6	7.1	4.3	8.6	70.9	71.3	69.9	71.0	73.6	65.8			
J-VECTOR/	4,801.00	3.4	6.8	0.0	0.0	0.0	0.0	114.7	114.2	114.7	114.1	114.4	112.7	20696	20694	19925
J-WATER0	4,722.00	3.5	7.0	3.6	7.1	4.3	8.6	71.6	71.5	70.6	71.1	73.9	65.7			
J-WATER0	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.3	71.2	70.3	70.8	73.6	65.4			
J-WATER0	4,724.00	3.5	7.0	3.6	7.1	4.3	8.6	71.1	71.0	70.1	70.6	73.4	65.3	3372	3299	8111
J-WATER0	4,723.00	3.5	7.0	3.6	7.1	4.3	8.6	71.6	71.5	70.5	71.1	73.9	65.8			
J-WATER0	4,721.00	3.5	7.0	3.6	7.1	4.3	8.6	72.4	72.4	71.4	72.0	74.7	66.6	2583	2536	4127
J-WELL02	4,730.00	3.5	7.0	3.6	7.1	4.3	8.6	69.0	68.9	68.0	68.5	71.2	63.1			
J-WELL100	4,717.00	0.0	0.0	0.0	0.0	0.0	0.0	70.1	70.6	69.1	70.3	72.8	65.1			
J-WELL100	4,717.00	0.0	0.0	0.0	0.0	0.0	0.0	70.4	70.9	69.4	70.6	73.1	65.4	3529	3446	12363
J-WHTOAK	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.7	72.0	70.7	71.6	74.3	66.4	2646	2597	4480
J-WHTOAK	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.1	72.4	71.1	72.1	74.7	66.8	2874	2818	5283
J-WIST/AS	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.1	73.4	72.1	73.0	75.7	67.8	3046	2987	5910
J-WIST/AZ	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	73.1	73.4	72.1	73.1	75.7	67.9	3195	3131	6700
J-WIST/CA	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	72.2	72.5	71.2	72.2	74.8	67.0			
J-WIST/HC	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	73.9	74.2	72.9	73.8	76.5	68.6	3279	3214	7024
J-WIST/LIL	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	73.5	73.7	72.4	73.4	76.0	68.1	2921	2866	5311
J-WIST/MF	4,718.00	3.5	7.0	3.6	7.1	4.3	8.6	71.8	72.1	70.8	71.8	74.4	66.6			
J-WIST/VE	4,713.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	74.3	72.9	73.9	76.6	68.8			
J-WLDRS/2	4,729.00	3.5	7.0	3.6	7.1	4.3	8.6	69.2	68.9	68.1	68.5	71.3	62.9	1984	1949	2782
J-WLDRS/7	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	70.4	70.2	69.4	69.8	72.6	64.3			
J-WLDRS/E	4,738.00	3.5	7.0	3.6	7.1	4.3	8.6	65.3	65.0	64.2	64.6	67.4	59.0	1511	1484	1952
J-WLDRS/E	4,740.00	3.5	7.0	3.6	7.1	4.3	8.6	64.4	64.1	63.4	63.7	66.5	58.1			
J-WLDRS/V	4,726.00	3.5	7.0	3.6	7.1	4.3	8.6	70.4	70.2	69.4	69.8	72.6	64.3	1975	1943	2712
J-WSTCOM	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	79.3	78.7	78.3	78.3	81.4	72.8	3795	3727	7697
J-WSTCOM	4,705.00	3.5	7.0	3.6	7.1	4.3	8.6	79.3	78.8	78.2	78.3	81.5	72.8	3881	3812	8373
J-WSTCOM	4,707.00	3.5	7.0	3.6	7.1	4.3	8.6	78.2	77.7	77.1	77.2	80.3	71.7			
J-WSTCOM	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	78.8	78.3	77.8	77.8	81.0	72.3	3699	3633	7474
J-WSTCOM	4,708.00	3.5	7.0	3.6	7.1	4.3	8.6	77.8	77.3	76.8	76.9	80.0	71.4	3784	3713	8259
J-WSTCOM	4,705.00	3.5	7.0	3.6	7.1	4.3	8.6	79.4	78.8	78.3	78.3	81.5	72.8			
J-WSTCOM	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.0	76.4	75.9	76.0	79.1	70.5			
J-WSTCOM	4,710.00	3.5	7.0	3.6	7.1	4.3	8.6	77.2	76.6	76.2	76.2	79.4	70.7	3223	3166	5623
J-WSTCOM	4,709.00	3.5	7.0	3.6	7.1	4.3	8.6	77.6	77.0	76.6	76.6	79.8	71.1	3348	3288	6048
J-WSTWD/	4,700.00	3.5	7.0	3.6	7.1	4.3	8.6	83.9	82.7	82.9	82.3	85.8	76.8	2547	2511	3471
J-WSTWD/	4,706.00	3.5	7.0	3.6	7.1	4.3	8.6	81.0	79.8	80.0	79.4	82.9	73.9	2397	2363	3256

Junction ID	Elevation (ft)	Demands (gpm)						Pressures (psi)						Fire Flow (gpm)*		
		EX_MDD	EX_PHD	5YR_MDD	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD PRVs Closed	5YR_MDD PRVs Closed	V_MDD PRVs Open
J-WSTWD/	4,704.00	3.5	7.0	3.6	7.1	4.3	8.6	82.0	80.8	81.0	80.4	83.9	74.9	2578	2540	3591
J-WSTWD(	4,705.00	3.5	7.0	3.6	7.1	4.3	8.6	81.5	80.3	80.5	79.9	83.4	74.4			
J-ZALD/10	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	73.7	73.0	73.3	76.3	67.8			
J-ZALD/E-E	4,717.00	3.5	7.0	3.6	7.1	4.3	8.6	74.0	73.7	73.0	73.3	76.3	67.8			
J-ZALD/LU(	4,715.00	3.5	7.0	3.6	7.1	4.3	8.6	74.9	74.5	73.8	74.1	77.1	68.6	3271	3208	6309
J-ZALD/OU	4,714.00	3.5	7.0	3.6	7.1	4.3	8.6	75.3	74.9	74.3	74.5	77.6	69.0	3170	3111	5781
J-ZALD01	4,716.00	3.5	7.0	3.6	7.1	4.3	8.6	74.5	74.1	73.4	73.7	76.7	68.2			
J-ZERO01	4,732.00	4.2	8.3	0.0	0.0	0.0	0.0	67.9	67.7	66.9	67.3	69.9	61.4	2645	2581	5641
J-ZERO02	4,735.00	4.2	8.3	0.0	0.0	0.0	0.0	66.6	66.4	65.6	66.0	68.5	59.9	2439	2378	5089
J-ZERO03	4,732.00	3.5	7.0	3.6	7.1	4.3	8.6	67.9	67.7	66.9	67.3	69.9	61.4			
PMP-10_N	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	50.1	53.7	49.1	53.6	54.8	52.6			
PMP-11_N	4,770.00	0.0	0.0	0.0	0.0	0.0	0.0	50.1	53.7	49.1	53.6	54.8	52.6			

*Existing and 5-YR MDD models produced errors when PRV valves in Buckeye Booster Station were open. Results reflect these valves being closed. Vested w/FF reflects PRV valves being open.

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
.	J-HEARTH07	J206	168.2	8	130	23	10	22	10	18	5	0.1	0.1	0.1	0.1	0.1	0.0
10TH01	J-10TH/S-END	J-MACK/10TH	132.8	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
10TH02	J-MACK/10TH	J-ZALD/10TH	290.0	8	130	31	53	28	57	0	74	0.2	0.3	0.2	0.4	0.0	0.5
10TH03	J-ZALD/10TH	J-BELAR/10TH	288.7	8	130	37	87	33	92	6	118	0.2	0.6	0.2	0.6	0.0	0.8
10TH04	J-BELAR/10TH	J-CR/10TH	291.0	8	120	68	150	60	160	3	206	0.4	1.0	0.4	1.0	0.0	1.3
10TH05	J-CR/10TH	J-S.ALLEY/10TH01	135.6	18	130	2133	1853	2133	1842	2009	1816	2.7	2.3	2.7	2.3	2.5	2.3
10TH06	J-S.ALLEY/10TH01	J-10TH01	71.8	18	130	3446	3231	3452	3228	3242	3213	4.3	4.1	4.4	4.1	4.1	4.1
10TH07	J-10TH01	J146	696.7	24	130	3442	3224	3449	3220	3238	3204	2.4	2.3	2.4	2.3	2.3	2.3
10TH08	J-S.ALLEY/10TH02	J-MONO/10TH	151.7	6	120	17	15	17	15	12	11	0.2	0.2	0.2	0.2	0.1	0.1
10TH09	J-MONO/10TH	J-C.ALLEY/10TH	147.6	6	120	44	45	44	45	44	48	0.5	0.5	0.5	0.5	0.5	0.5
10TH10	J-C.ALLEY/10TH	J-ESM/10TH02	144.1	6	120	108	110	108	110	105	113	1.2	1.2	1.2	1.2	1.2	1.3
10TH11	J-ESM/10TH01	J-N.ALLEY/10TH	149.5	6	120	105	100	105	100	99	99	1.2	1.1	1.2	1.1	1.1	1.1
10TH12	J-N.ALLEY/10TH	J-395/10TH01	131.9	6	120	165	152	165	151	154	149	1.9	1.7	1.9	1.7	1.7	1.7
10TH13	J-395/10TH01	J-395/10TH02	67.8	8	120	118	107	118	106	110	104	0.8	0.7	0.8	0.7	0.7	0.7
10TH14	J-395/10TH02	J-CVI02	125.4	8	120	8	2	8	2	6	0	0.0	0.0	0.0	0.0	0.0	0.0
1ST01	J-CR/1ST	J-S.ALLEY/1ST	138.1	12	130	7	17	3	8	74	86	0.0	0.0	0.0	0.0	0.2	0.2
1ST02	J-S.ALLEY/1ST	J-MONO/39502	92.8	12	130	100	124	110	145	278	375	0.3	0.4	0.3	0.4	0.8	1.1
1ST03	J-MONO/39502	J-MONO/39504	177.3	12	130	77	123	86	147	292	397	0.2	0.3	0.2	0.4	0.8	1.1
1ST04	J-MONO/39501	J-MONO/39502	75.0	6	120	20	6	21	10	19	31	0.2	0.1	0.2	0.1	0.2	0.4
1ST05	J-MONO/39501	J-MONO/39504	168.0	6	120	5	19	1	24	47	65	0.1	0.2	0.0	0.3	0.5	0.7
2ND01	J-SPRCE/LOOP02	J-DES/2ND	345.9	8	130	7	13	7	13	8	16	0.0	0.1	0.0	0.1	0.1	0.1
2ND02	J-DES/2ND	J-WLDRS/2ND	254.7	8	130	24	48	25	49	30	59	0.2	0.3	0.2	0.3	0.2	0.4
2ND03	J-WLDRS/2ND	J-CR/2ND	266.9	6	120	72	96	71	95	51	77	0.8	1.1	0.8	1.1	0.6	0.9
2ND04	J-MONO/2ND	J-C.ALLEY/2ND	154.6	6	120	34	11	32	18	39	62	0.4	0.1	0.4	0.2	0.4	0.7
39501	J-39501	J-39502	138.7	8	120	187	133	185	127	165	104	1.2	0.8	1.2	0.8	1.1	0.7
39502	J172	J-39506	198.4	8	120	37	19	36	17	30	10	0.2	0.1	0.2	0.1	0.2	0.1
39503	J182	J-39508	354.8	8	120	185	107	182	100	157	67	1.2	0.7	1.2	0.6	1.0	0.4
39504	J-39508	J-39510	241.0	8	120	178	93	175	86	148	50	1.1	0.6	1.1	0.5	0.9	0.3
39505	J-39510	J-395/LUCE01	310.6	8	120	171	79	168	72	140	33	1.1	0.5	1.1	0.5	0.9	0.2
39506	J-395/LUCE01	J-395/LUCE02	26.2	8	120	199	191	199	190	189	190	1.3	1.2	1.3	1.2	1.2	1.2
39507	J-395/LUCE02	J-395/LUCE03	185.3	8	120	228	202	228	202	211	196	1.5	1.3	1.5	1.3	1.3	1.2
39508	J144	J-395/10TH01	499.5	8	120	158	147	158	147	147	144	1.0	0.9	1.0	0.9	0.9	0.9
39509	J-395/10TH01	J-395/9TH01	369.5	6	120	115	109	115	109	108	108	1.3	1.2	1.3	1.2	1.2	1.2
39510	J-395/9TH01	J-395/8TH01	369.5	6	120	100	107	100	107	96	111	1.1	1.2	1.1	1.2	1.1	1.3
39511	J-395/8TH01	J-395/7TH	367.9	6	120	107	113	108	113	103	116	1.2	1.3	1.2	1.3	1.2	1.3
39512	J-395/7TH	J-395/6TH	312.1	6	120	96	108	97	109	95	116	1.1	1.2	1.1	1.2	1.1	1.3
39513	J-395/6TH	J-395/5TH01	327.1	6	120	22	18	21	21	17	52	0.3	0.2	0.2	0.2	0.2	0.6
39514	J-395/5TH02	J-39515	149.6	4	120	4	11	4	13	12	26	0.1	0.3	0.1	0.3	0.3	0.7
39515	J-39515	J-395/3RD03	583.4	4	120	8	4	7	5	7	17	0.2	0.1	0.2	0.1	0.2	0.4
39516	J-395/3RD03	J262	1265.7	4	120	7	4	7	6	11	18	0.2	0.1	0.2	0.1	0.3	0.5
39519	J-39503	J-39504	150.8	6	130	7	14	7	14	9	17	0.1	0.2	0.1	0.2	0.1	0.2
39520	J-39502	J-39504	75.1	6	130	144	100	142	96	127	77	1.6	1.1	1.6	1.1	1.4	0.9
39521	J-39504	J-39505	271.1	6	130	133	79	131	74	114	51	1.5	0.9	1.5	0.8	1.3	0.6
39522	J-39505	J-39507	286.2	8	130	130	72	128	67	109	42	0.8	0.5	0.8	0.4	0.7	0.3
39523	J176	J-39509	351.9	8	130	123	58	121	53	101	25	0.8	0.4	0.8	0.3	0.6	0.2
39524	J-39509	J-395/LUCE04	370.8	8	130	112	37	110	32	88	1	0.7	0.2	0.7	0.2	0.6	0.0
39525	J-395/LUCE04	J-395/LUCE05	28.0	8	130	143	138	143	137	136	137	0.9	0.9	0.9	0.9	0.9	0.9
39526	J-395/LUCE05	J-39511	223.2	8	130	157	136	157	136	144	129	1.0	0.9	1.0	0.9	0.9	0.8
39527	J-39511	J-39512	84.9	8	130	419	381	420	380	390	372	2.7	2.4	2.7	2.4	2.5	2.4

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
39528	J-39512	J-39513	221.3	12	130	423	388	424	387	394	380	1.2	1.1	1.2	1.1	1.1	1.1
39529	J-39513	J-39514	50.2	12	130	430	402	431	402	403	397	1.2	1.1	1.2	1.1	1.1	1.1
39530	J-39514	J-395/10TH02	237.9	12	130	382	363	382	363	359	362	1.1	1.0	1.1	1.0	1.0	1.0
39531	J-395/10TH02	J-395/CVI	445.2	12	130	259	261	260	262	248	267	0.7	0.7	0.7	0.7	0.7	0.8
39532	J-39509	J-39517	122.4	6	130	7	14	7	14	9	17	0.1	0.2	0.1	0.2	0.1	0.2
39533	J-395/IRNWD	J-395/N-BOUND	940.8	12	130	310	257	357	294	343	314	0.9	0.7	1.0	0.8	1.0	0.9
39534	J-395/N-BOUND	J-395/N-END	264.0	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
39535	J-395/N-BOUND	J-N-BOUND01	892.2	12	130	303	243	350	280	335	297	0.9	0.7	1.0	0.8	0.9	0.8
39536	J-N-BOUND01	J-N-BOUND/MV	636.1	12	130	300	236	346	273	330	288	0.9	0.7	1.0	0.8	0.9	0.8
39537	J-CR/395	J-395/E-END	85.6	8	120	18	17	18	16	2	8	0.1	0.1	0.1	0.1	0.0	0.0
39538	J-CR/395	J-CR/E-END	288.0	8	120	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
3RD01	J-CR/3RD	J-S.ALLEY/3RD	144.1	6	120	25	22	26	22	27	20	0.3	0.2	0.3	0.2	0.3	0.2
3RD02	J-S.ALLEY/3RD	J-MONO/3RD	142.4	6	120	75	56	74	51	26	17	0.9	0.6	0.8	0.6	0.3	0.2
3RD03	J-MONO/3RD	J-C.ALLEY/3RD	150.6	6	120	48	39	47	35	18	15	0.5	0.4	0.5	0.4	0.2	0.2
3RD04	J-C.ALLEY/3RD	J-ESM/3RD	147.3	6	120	49	21	48	15	6	38	0.6	0.2	0.5	0.2	0.1	0.4
3RD05	J-ESM/3RD	J-395/3RD01	65.6	6	120	11	20	11	22	17	27	0.1	0.2	0.1	0.2	0.2	0.3
3RD06	J-395/3RD01	J-395/3RD02	37.2	3	120	7	13	8	14	12	18	0.3	0.6	0.3	0.7	0.6	0.8
3RD07	J-395/3RD02	J-395/3RD03	44.4	8	130	4	6	4	7	8	10	0.0	0.0	0.0	0.0	0.1	0.1
4TH01	J-ESM/4TH	J-N.ALLEY/4TH	148.6	10	130	38	3	37	9	18	56	0.2	0.0	0.2	0.0	0.1	0.2
4TH02	J-N.ALLEY/4TH	J-4TH/N-END	96.1	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
5TH01	J-CR/5TH	J-S.ALLEY/5TH	139.1	8	120	32	33	33	33	33	32	0.2	0.2	0.2	0.2	0.2	0.2
5TH02	J-S.ALLEY/5TH	J-MONO/5TH	146.0	6	120	123	127	125	128	127	135	1.4	1.4	1.4	1.5	1.4	1.5
5TH03	J-MONO/5TH	J-C.ALLEY/5TH	147.9	6	120	69	57	68	56	54	55	0.8	0.6	0.8	0.6	0.6	0.6
5TH04	J-C.ALLEY/5TH	J-ESM/5TH	147.0	6	120	51	24	50	23	23	17	0.6	0.3	0.6	0.3	0.3	0.2
5TH05	J-ESM/5TH	J-N.ALLEY/5TH	149.4	6	120	19	15	19	16	17	22	0.2	0.2	0.2	0.2	0.2	0.3
5TH06	J-N.ALLEY/5TH	J-395/5TH01	130.0	10	130	25	8	24	6	4	10	0.1	0.0	0.1	0.0	0.0	0.0
5TH07	J-395/5TH01	J-395/5TH02	39.2	6	120	1	18	0	20	16	34	0.0	0.2	0.0	0.2	0.2	0.4
5TH08	J-BNTLYHER01	J-BNTLYHER02	37.2	12	130	11	21	11	21	13	26	0.0	0.1	0.0	0.1	0.0	0.1
6TH01	J-CR/6TH	J-S.ALLEY/6TH02	141.9	16	130	1272	1182	1278	1174	1150	1105	2.0	1.9	2.0	1.9	1.8	1.8
6TH02	J-S.ALLEY/6TH02	J-MONO/6TH	147.2	16	130	447	231	447	214	343	88	0.7	0.4	0.7	0.3	0.5	0.1
6TH03	J-MONO/6TH	J-C.ALLEY/6TH01	147.1	16	130	409	163	407	143	284	24	0.7	0.3	0.7	0.2	0.5	0.0
6TH04	J-C.ALLEY/6TH01	J-ESM/6TH	146.6	16	130	346	58	343	31	186	185	0.6	0.1	0.5	0.1	0.3	0.3
6TH05	J-ESM/6TH	J-N.ALLEY/6TH	145.5	16	130	267	66	262	97	76	344	0.4	0.1	0.4	0.2	0.1	0.5
6TH06	J-N.ALLEY/6TH	J-395/6TH	134.4	16	130	182	205	175	240	48	525	0.3	0.3	0.3	0.4	0.1	0.8
7TH01	J-WLDRS/7TH	J-CR/7TH	267.4	6	120	9	38	10	41	38	75	0.1	0.4	0.1	0.5	0.4	0.8
7TH02	J-ESM/7TH	J-N.ALLEY/7TH	145.4	6	120	14	11	14	11	12	9	0.2	0.1	0.2	0.1	0.1	0.1
7TH03	J-N.ALLEY/7TH	J-395/7TH	135.3	6	120	14	11	14	11	12	8	0.2	0.1	0.2	0.1	0.1	0.1
8TH01	J-WLDRS/W-END	J-CR/8TH	529.1	4	120	24	22	24	22	19	14	0.6	0.6	0.6	0.6	0.5	0.4
8TH02	J-CR/8TH	J-S.ALLEY/8TH	141.7	6	120	80	64	80	63	65	46	0.9	0.7	0.9	0.7	0.7	0.5
8TH03	J-S.ALLEY/8TH	J-MONO/8TH	146.9	6	120	9	9	10	10	8	9	0.1	0.1	0.1	0.1	0.1	0.1
8TH04	J-MONO/8TH	J-C.ALLEY/8TH	151.3	6	120	5	3	5	2	5	2	0.1	0.0	0.1	0.0	0.1	0.0
8TH05	J50	J-ESM/8TH	125.1	6	120	19	13	19	13	17	11	0.2	0.2	0.2	0.1	0.2	0.1
8TH06	J-ESM/8TH	J-N.ALLEY/8TH01	107.4	6	120	95	95	95	95	90	95	1.1	1.1	1.1	1.1	1.0	1.1
8TH07	J-N.ALLEY/8TH01	J-N.ALLEY/8TH02	36.9	6	120	15	26	16	26	17	31	0.2	0.3	0.2	0.3	0.2	0.4
8TH08	J-N.ALLEY/8TH02	J-395/8TH01	139.7	6	120	78	70	78	70	71	66	0.9	0.8	0.9	0.8	0.8	0.8
8TH09	J-395/8TH01	J-WATER02	217.8	6	120	82	69	82	68	73	62	0.9	0.8	0.9	0.8	0.8	0.7
9TH01	J-ESM/9TH	J-N.ALLEY/9TH01	107.0	6	120	11	18	11	18	11	21	0.1	0.2	0.1	0.2	0.1	0.2
9TH02	J-N.ALLEY/9TH01	J-N.ALLEY/9TH02	40.6	6	120	89	82	89	82	83	80	1.0	0.9	1.0	0.9	0.9	0.9
9TH03	J-N.ALLEY/9TH02	J-395/9TH01	136.8	6	120	19	9	19	8	16	5	0.2	0.1	0.2	0.1	0.2	0.1

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
ALLEY01	J-S.ALLEY/10TH01	J-S.ALLEY/10TH02	15.0	18	130	1316	1386	1323	1392	1237	1405	1.7	1.7	1.7	1.8	1.6	1.8
ALLEY02	J-S.ALLEY/10TH02	J-S.ALLEY/8TH	726.3	18	130	1302	1378	1309	1384	1230	1403	1.6	1.7	1.7	1.7	1.6	1.8
ALLEY03	J-S.ALLEY/8TH	J-S.ALLEY/6TH01	643.8	18	130	1216	1311	1223	1319	1161	1357	1.5	1.7	1.5	1.7	1.5	1.7
ALLEY04	J-S.ALLEY/6TH01	J-S.ALLEY/6TH02	38.9	10	130	1220	1318	1226	1326	1165	1365	5.0	5.4	5.0	5.4	4.8	5.6
ALLEY05	J-S.ALLEY/6TH02	J-S.ALLEY/6TH03	49.0	10	130	397	375	399	373	362	356	1.6	1.5	1.6	1.5	1.5	1.5
ALLEY06	J-S.ALLEY/6TH03	J-S.ALLEY/5TH	277.2	10	130	401	382	403	380	367	365	1.6	1.6	1.6	1.6	1.5	1.5
ALLEY07	J-S.ALLEY/5TH	J-S.ALLEY/WELL02	114.1	10	130	495	483	498	482	465	476	2.0	2.0	2.0	2.0	1.9	1.9
ALLEY08	J-S.ALLEY/WELL02	J-S.ALLEY/3RD	528.3	8	130	165	190	169	196	211	269	1.1	1.2	1.1	1.2	1.3	1.7
ALLEY09	J-S.ALLEY/3RD	J-S.ALLEY/1ST	661.8	10	120	111	149	117	160	207	297	0.5	0.6	0.5	0.7	0.8	1.2
ALLEY10	J50	J-C.ALLEY/10TH	734.6	6	120	68	72	68	72	65	74	0.8	0.8	0.8	0.8	0.7	0.8
ALLEY11	J-C.ALLEY/8TH	J-C.ALLEY/7TH	357.4	6	120	88	96	89	97	85	100	1.0	1.1	1.0	1.1	1.0	1.1
ALLEY12	J-C.ALLEY/7TH	J-C.ALLEY/6TH01	322.2	6	130	92	103	93	104	89	108	1.0	1.2	1.1	1.2	1.0	1.2
ALLEY13	J-C.ALLEY/6TH01	J-C.ALLEY/6TH02	51.0	6	130	33	5	32	0	5	44	0.4	0.1	0.4	0.0	0.1	0.5
ALLEY14	J-C.ALLEY/6TH02	J-C.ALLEY/5TH	275.3	6	120	37	12	36	7	0	35	0.4	0.1	0.4	0.1	0.0	0.4
ALLEY15	J-C.ALLEY/5TH	J-C.ALLEY/4TH	323.5	6	120	22	14	21	19	27	65	0.2	0.2	0.2	0.2	0.3	0.7
ALLEY16	J-C.ALLEY/4TH	J-C.ALLEY/3RD	316.3	6	130	25	7	24	12	23	56	0.3	0.1	0.3	0.1	0.3	0.6
ALLEY17	J-C.ALLEY/3RD	J-C.ALLEY/2ND	319.1	8	130	30	18	28	25	43	70	0.2	0.1	0.2	0.2	0.3	0.4
ALLEY18	J-N.ALLEY/W-END	J-N.ALLEY/10TH	91.7	2	120	4	7	4	7	4	9	0.4	0.7	0.4	0.7	0.4	0.9
ALLEY19	J-N.ALLEY/10TH	J-N.ALLEY/9TH02	370.3	6	130	67	66	67	66	63	67	0.8	0.7	0.8	0.7	0.7	0.8
ALLEY22	J-N.ALLEY/9TH01	J-N.ALLEY01	138.1	6	120	103	107	104	107	99	109	1.2	1.2	1.2	1.2	1.1	1.2
ALLEY23	J-N.ALLEY01	J-N.ALLEY/8TH01	236.8	6	120	107	114	107	114	103	118	1.2	1.3	1.2	1.3	1.2	1.3
ALLEY24	J-N.ALLEY/8TH02	J-N.ALLEY03	167.8	6	130	97	103	97	103	93	106	1.1	1.2	1.1	1.2	1.1	1.2
ALLEY25	J-N.ALLEY03	J-N.ALLEY/7TH	198.1	6	120	100	110	101	110	97	115	1.1	1.2	1.1	1.3	1.1	1.3
ALLEY26	J-N.ALLEY/7TH	J-N.ALLEY/6TH	311.7	6	130	104	116	105	117	102	122	1.2	1.3	1.2	1.3	1.2	1.4
ALLEY27	J-N.ALLEY/6TH	J-N.ALLEY/5TH	328.0	6	130	22	16	21	19	18	50	0.3	0.2	0.2	0.2	0.2	0.6
ALLEY28	J-N.ALLEY/5TH	J-N.ALLEY/4TH	325.8	10	130	31	17	30	23	26	73	0.1	0.1	0.1	0.1	0.1	0.3
ALYSSUM	J-CANT/ALYS	J-ALYSSUM	125.5	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
ARBELLO	J-ARB/MNTRRA	J-ARB/MNTCTO	290.9	8	130	52	58	55	64	75	96	0.3	0.4	0.4	0.4	0.5	0.6
ASHWD	J-BOUG/ASHWD	J-CDR/ASHWD	289.6	8	130	69	100	69	102	81	116	0.4	0.6	0.4	0.6	0.5	0.7
ASPNGRV0	J-88/ASPNGRV	J-ASPNGRV	172.7	8	130	27	44	27	45	29	52	0.2	0.3	0.2	0.3	0.2	0.3
ASPNGRV0	J-ASPNGRV	J124	467.7	8	130	11	17	11	17	11	20	0.1	0.1	0.1	0.1	0.1	0.1
ASPNGRV0	J-ASPNGRV/LIB	J126	328.2	8	130	9	13	9	14	9	15	0.1	0.1	0.1	0.1	0.1	0.1
ASTER	J-ASTER	J-WIST/ASTER	130.6	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
AZALEA	J-WIST/AZALEA	J-AZALEA	138.8	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
AZURE01	J-AZURE/MNTRRA	J-AZURE/MNTRRACT	126.5	8	130	202	220	201	220	207	215	1.3	1.4	1.3	1.4	1.3	1.4
AZURE02	J-AZURE/MNTRRACT	J-AZURE/MNTCTO	162.7	8	130	209	234	208	234	215	232	1.3	1.5	1.3	1.5	1.4	1.5
AZURE03	J-AZURE/MNTCTO	J-AZURE/SEN	32.0	8	130	169	191	171	198	200	242	1.1	1.2	1.1	1.3	1.3	1.5
AZURE04	J-AZURE/SEN	J-AZURE/TUSC	190.6	8	130	176	205	178	212	209	259	1.1	1.3	1.1	1.4	1.3	1.7
AZURE05	J-AZURE/TUSC	J-AZURE/LASBRI	44.8	8	110	183	219	185	226	217	276	1.2	1.4	1.2	1.4	1.4	1.8
AZURE06	J-AZURE/LASBRI	J-AZURE/FIORE	147.0	8	130	171	201	176	212	214	272	1.1	1.3	1.1	1.4	1.4	1.7
AZURE07	J-AZURE/FIORE	J-AZURE/CHAN	137.4	8	130	178	215	183	226	223	290	1.1	1.4	1.2	1.4	1.4	1.8
AZURE08	J-AZURE/CHAN	J-AZURE/BEL	127.6	8	130	99	116	99	120	117	138	0.6	0.7	0.6	0.8	0.7	0.9
AZURE09	J-AZURE/BEL	J-AZURE/GAL	161.2	8	130	106	130	106	134	125	155	0.7	0.8	0.7	0.9	0.8	1.0
BALER01	J-SANF/BALER	J-MES01	77.2	8	130	21	42	21	43	26	52	0.1	0.3	0.1	0.3	0.2	0.3
BALER02	J-MES01	J-MES02	205.6	8	130	10	20	10	20	12	24	0.1	0.1	0.1	0.1	0.1	0.2
BALER03	J-MES02	J-MES03	285.5	8	130	6	13	6	13	8	16	0.0	0.1	0.0	0.1	0.1	0.1
BALER04	J272	J-MES04	514.2	8	130	1	1	1	1	1	2	0.0	0.0	0.0	0.0	0.0	0.0
BALER05	J-MES04	J270	453.1	8	130	4	8	4	9	5	10	0.0	0.1	0.0	0.1	0.0	0.1
BEHIA	J-LABA/BEHIA	J-BEHIA/END	167.0	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow						Velocity					
						EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
BELAR01	J-BELAR/OULA	J136	453.1	8	120	7	52	2	55	20	67	0.0	0.3	0.0	0.4	0.1	0.4
BELAR02	J138	J-BELAR/10TH	510.4	8	120	37	50	34	54	12	71	0.2	0.3	0.2	0.3	0.1	0.5
BELAR03	J-BELAR/10TH	J-BELAR/E-END	463.2	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
BELSERA	J-BELSERA	J-AZURE/BEL	158.4	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
BENTLEY01	J-BUCK/WTR01	J60	207.0	12	130	1948	1925	1960	1929	1917	1982	5.5	5.5	5.6	5.5	5.4	5.6
BENTLEY02	J158	J-CODGARAGE	439.9	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
BIRCH	J-BRCH	J-LIND/BRCH	115.2	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
BLSPRCE	J-BLUSPRCE	J-CANT/EVRGRN	185.6	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
BOUG01	J-BOUG/SYC	J-LANT/BOUG01	468.8	12	130	233	262	233	266	255	286	0.7	0.7	0.7	0.8	0.7	0.8
BOUG02	J-BOUG/HONEY	J-BOUG/SYC	432.4	12	130	207	246	207	250	226	273	0.6	0.7	0.6	0.7	0.6	0.8
BOUG03	J-BOUG/ASHWD	J-BOUG/HONEY	336.3	12	130	146	226	146	231	194	262	0.4	0.6	0.4	0.7	0.6	0.7
BOUG04	J-BOUG/CANT01	J-BOUG/ASHWD	409.1	12	130	218	333	218	340	279	387	0.6	0.9	0.6	1.0	0.8	1.1
BOUG05	J-BOUG/MRNGLRY	J-BOUG/CANT01	645.1	12	130	199	315	200	322	251	370	0.6	0.9	0.6	0.9	0.7	1.0
BOUG06	J-BOUG/CANT02	J-BOUG/MRNGLRY	278.5	12	130	243	438	245	448	341	522	0.7	1.2	0.7	1.3	1.0	1.5
BOUG07	J-LANT/BOUG02	J-BOUG/CANT02	449.3	12	130	328	588	331	602	451	702	0.9	1.7	0.9	1.7	1.3	2.0
BOUG08	J-BOUG/WELL05-01	J-LANT/BOUG02	279.3	12	130	563	1075	568	1101	820	1289	1.6	3.0	1.6	3.1	2.3	3.7
BOUG09	J-BOUG/FREIDA	J-BOUG/WELL05-01	113.7	12	130	201	138	204	152	46	232	0.6	0.4	0.6	0.4	0.1	0.7
BOUG10	J-BUCK/BOUG01	J-BOUG/FREIDA	125.4	12	130	191	159	193	174	33	258	0.5	0.5	0.5	0.5	0.1	0.7
BOUG11	J-BUCK/BOUG04	J-BUCK/BOUG01	88.6	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
BRISTLECN	J-MAHO/BRIST	J-BRSTLCN	96.7	4	130	4	7	4	7	4	9	0.1	0.2	0.1	0.2	0.1	0.2
BUCK01	J-395/6TH	J-BUCK/WTR01	191.7	16	130	104	338	95	378	164	702	0.2	0.5	0.2	0.6	0.3	1.1
BUCK02	J-BUCK/WTR01	J-BUCK/WTR02	222.4	16	130	1814	1357	1816	1321	1534	1047	2.9	2.2	2.9	2.1	2.4	1.7
BUCK03	J148	J-BUCK01	1151.0	16	130	1759	1235	1760	1196	1456	893	2.8	2.0	2.8	1.9	2.3	1.4
BUCK04	J-BUCK01	J-BUCK/BOUG02	991.7	16	130	1756	1228	1757	1189	1452	885	2.8	2.0	2.8	1.9	2.3	1.4
BUCK05	J-BUCK/BOUG01	J-BUCK/BOUG02	10.1	16	130	184	173	186	188	25	275	0.3	0.3	0.3	0.3	0.0	0.4
BUCK06	J-BUCK/BOUG02	J-BUCK/BOUG03	66.0	16	130	1940	1055	1943	1001	1352	284	3.1	1.7	3.1	1.6	2.2	0.5
BUCK07	J-BUCK/BOUG03	J-BOUG/WELL05-02	304.1	16	130	1304	1116	1312	1109	1161	1070	2.1	1.8	2.1	1.8	1.9	1.7
BUCK08	J-BUCK/BOUG03	J-BUCK/HEY01	71.3	16	130	3244	2172	3255	2110	2513	1354	5.2	3.5	5.2	3.4	4.0	2.2
BUCK09	J-BUCK/HEY01	J-BUCK/SANF	951.7	16	130	191	747	190	786	500	979	0.3	1.2	0.3	1.3	0.8	1.6
BUCK10	J-BUCK/SANF	J-BUCK02	2295.8	16	110	695	1422	700	1480	1233	2195	1.1	2.3	1.1	2.4	2.0	3.5
BUCK11	J-BUCK/HEY02	J-BUCK03	3240.0	30	130	1005	2089	1011	2176	1796	3206	0.5	0.9	0.5	1.0	0.8	1.5
BUCK14	J10	J-BUCK/MDVLY	911.3	16	130	379	456	379	476	437	754	0.6	0.7	0.6	0.8	0.7	1.2
BUCK15	J-BUCK/MDVLY	J-BUCK06	378.2	16	130	390	477	390	497	450	779	0.6	0.8	0.6	0.8	0.7	1.2
BUCK16	J-BUCK06	J-BUCK/BENT	382.0	16	130	390	477	390	497	450	779	0.6	0.8	0.6	0.8	0.7	1.2
BUCK17	J-BUCK/BENT	J-BUCK/VECTOR	993.8	16	130	467	631	468	654	545	968	0.7	1.0	0.7	1.0	0.9	1.5
BUCK18	J-BUCK/VECTOR	J-BUCK/ORB01	791.5	16	130	810	647	812	631	738	328	1.3	1.0	1.3	1.0	1.2	0.5
BUCK20	J-BUCK/WELL0902	J-BUCK05	550.5	12	130	14	28	14	28	17	34	0.0	0.1	0.0	0.1	0.0	0.1
BUCK21	J-BUCK05	J-BUCK11	1339.1	12	130	14	28	14	28	17	34	0.0	0.1	0.0	0.1	0.0	0.1
BUCK22	J-BUCK11	J-BUCK13	623.0	12	130	7	14	7	14	9	17	0.0	0.0	0.0	0.0	0.0	0.0
BUCK23	J-BUCK11	J-BUCK12	292.6	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
BUCK24	J-BUCK13	J-BUCK14	185.4	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
BUCK26	J-BUCK/WELL0903	J-BUCK07	1288.8	30	110	365	1431	365	1557	961	3023	0.2	0.7	0.2	0.7	0.4	1.4
BUCK28	J-BUCK/ORB03	J-BUCK/ORB02	46.0	30	110	365	1431	365	1557	961	3023	0.2	0.7	0.2	0.7	0.4	1.4
BUCK30	J-BUCK08	J-BUCK09	500.7	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
BUCK31	J-BUCK09	J-BUCK10	2199.9	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
BUCK32	J314	J316	543.1	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
BUCK33	J324	J-AMBER	569.8	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
BUCK34	J326	J-AMBRTANK01	1887.4	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
BUCK35	J-AMBRTANK01	J-AMBRTANK02	57.9	24	110	1074	987	1073	1133	348	2944	0.8	0.7	0.8	0.8	0.2	2.1

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow						Velocity					
						EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
BURR01	J-MACK/BURR	J-BURR/LABA	273.4	6	120	34	17	33	17	27	16	0.4	0.2	0.4	0.2	0.3	0.2
BURR02	J-BURR/LABA	J-BURR/END	112.3	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
CAMELLIA	J-CAMELLIA	J-WIST/CAM	202.7	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
CANT01	J-BOUG/CANT01	J-CANT/LIND	382.5	8	130	22	25	22	25	33	25	0.1	0.2	0.1	0.2	0.2	0.2
CANT02	J-CANT/LIND	J-CANT/DAPH	212.7	8	130	30	45	30	46	40	52	0.2	0.3	0.2	0.3	0.3	0.3
CANT03	J-CANT/DAPH	J-CANT/EVRGRN	287.6	8	130	50	80	50	82	67	94	0.3	0.5	0.3	0.5	0.4	0.6
CANT04	J-CANT/EVRGRN	J-CANT/ALYS	238.4	8	130	61	101	61	104	80	120	0.4	0.6	0.4	0.7	0.5	0.8
CANT05	J-CANT/ALYS	J-CANT/TULIP	194.7	8	130	68	115	68	118	89	137	0.4	0.7	0.4	0.8	0.6	0.9
CANT06	J-CANT/TULIP	J-BOUG/CANT02	295.6	8	130	82	143	83	146	106	171	0.5	0.9	0.5	0.9	0.7	1.1
CARVAL	J-CR/CARV	J-CARVAL	494.2	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
CDRWD01	J-WSTWD/CDR	J-CRDWD	247.8	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
CDRWD02	J-WSTWD/CDR	J-CDRWD	278.2	6	120	40	41	41	41	40	42	0.5	0.5	0.5	0.5	0.5	0.5
CDRWD03	J-CDRWD	J-MAHO/CDRWD	256.9	6	120	47	55	48	55	49	59	0.5	0.6	0.5	0.6	0.6	0.7
CDRWDCT	J-CDRWD	J-CDRWDCT	154.9	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
CEDAR01	J-CDR/WHTOAK	J-CDR/WHTPINE	220.5	8	130	30	38	30	39	35	43	0.2	0.2	0.2	0.2	0.2	0.3
CEDAR02	J-CDR/WHTPINE	J-CDR/ASHWD	163.8	8	130	45	62	45	63	52	71	0.3	0.4	0.3	0.4	0.3	0.5
CHANTEL01	J-HEY/CHANTEL	J-AZURE/CHAN	301.9	8	130	63	68	71	79	100	147	0.4	0.4	0.5	0.5	0.6	0.9
CHANTEL02	J-AZURE/CHAN	J-SANF/CHANTEL	597.7	8	130	20	38	16	35	11	13	0.1	0.2	0.1	0.2	0.1	0.1
CLVRCT	J-TAM/FIR	J-CLVR	109.1	4	130	4	7	4	7	4	9	0.1	0.2	0.1	0.2	0.1	0.2
CONIF01	J-SYC/CONIF	J-CONIF/W-END	277.5	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
CONIF02	J-SYC/CONIF	J-CONIF/PINION01	152.6	8	130	37	37	37	38	42	38	0.2	0.2	0.2	0.2	0.3	0.2
CONIF03	J-CONIF/PINION01	J-CONIF/PINION02	187.4	8	130	25	28	25	29	29	30	0.2	0.2	0.2	0.2	0.2	0.2
CONIF04	J-CONIF/PINION02	J-CDR/WHTOAK	210.2	8	130	48	58	47	59	55	64	0.3	0.4	0.3	0.4	0.4	0.4
CR01	J130	J-CR/LIB	196.7	6	130	77	42	77	40	65	35	0.9	0.5	0.9	0.5	0.7	0.4
CR02	J132	J-CR/OULA	287.1	6	130	76	30	75	29	60	18	0.9	0.3	0.9	0.3	0.7	0.2
CR03	J-CR/OULA	J-CR/CARV	484.2	8	120	66	107	68	111	77	125	0.4	0.7	0.4	0.7	0.5	0.8
CR04	J-CR/CARV	J-CR/LUCE	372.9	8	120	73	121	75	125	85	142	0.5	0.8	0.5	0.8	0.5	0.9
CR05	J-CR/LUCE	J-CR/WELL03	396.9	8	120	134	201	138	206	150	235	0.9	1.3	0.9	1.3	1.0	1.5
CR06	J-CR/WELL03	J-CR/10TH	342.3	18	130	1943	1876	1950	1874	1904	1899	2.5	2.4	2.5	2.4	2.4	2.4
CR07	J-CR/10TH	J150	407.7	8	120	126	134	126	135	113	131	0.8	0.9	0.8	0.9	0.7	0.8
CR08	J-CR/8TH	J-CR/7TH	366.9	8	120	188	190	189	190	167	180	1.2	1.2	1.2	1.2	1.1	1.1
CR09	J-CR/7TH	J-CR/6TH	317.6	8	120	201	235	203	238	209	263	1.3	1.5	1.3	1.5	1.3	1.7
CR10	J-CR/6TH	J-CR/5TH	325.7	18	130	1477	1424	1484	1419	1363	1377	1.9	1.8	1.9	1.8	1.7	1.7
CR11	J-CR/5TH	J-CR/WELL02	119.8	18	130	1512	1464	1520	1459	1400	1418	1.9	1.8	1.9	1.8	1.8	1.8
CR12	J-CR/WELL02	J-CR/3RD	519.7	8	120	125	153	129	160	175	234	0.8	1.0	0.8	1.0	1.1	1.5
CR13	J-CR/3RD	J-CR/2ND	321.2	8	120	96	124	100	131	144	205	0.6	0.8	0.6	0.8	0.9	1.3
CR14	J-CR/2ND	J-CR/1ST	341.3	8	120	21	21	25	29	89	120	0.1	0.1	0.2	0.2	0.6	0.8
CR15	J-CR/1ST	J-CR/395	551.4	8	120	25	31	25	30	10	25	0.2	0.2	0.2	0.2	0.1	0.2
CVI01	J-CVI02	J-CVI01	354.0	8	120	70	69	70	69	67	70	0.4	0.4	0.4	0.4	0.4	0.4
CVI02	J-CVI01	J-395/CVI	225.1	8	120	73	76	74	76	71	79	0.5	0.5	0.5	0.5	0.5	0.5
CVMED01	J-IRNWD/CVMED	J-CVMED01	225.7	12	130	18	35	18	36	22	43	0.1	0.1	0.1	0.1	0.1	0.1
CVMED02	J224	J226	177.6	12	130	3	5	3	5	3	6	0.0	0.0	0.0	0.0	0.0	0.0
CVMED03	J-CVMED02	J-CVMED01	198.7	12	130	8	16	8	16	10	19	0.0	0.0	0.0	0.0	0.0	0.1
CVMED04	J-CVMED02	J-CVMED03	205.2	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
DAPHNE01	J-CANT/DAPH	J-DAPH	265.8	8	130	17	28	17	29	23	33	0.1	0.2	0.1	0.2	0.1	0.2
DAPHNE02	J-DAPH	J-LIND	399.3	8	130	14	21	14	22	18	24	0.1	0.1	0.1	0.1	0.1	0.2
DESERET01	J-DES/S-END	J-DES/BRCH	556.1	6	120	0	1	0	1	0	1	0.0	0.0	0.0	0.0	0.0	0.0
DESERET02	J-DES/BRCH	J260	342.7	8	110	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.1	0.1
DESERET03	J-DES/2ND	J-DES/W-END	379.2	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
DHS01	J-HWY8804	J-DHS10	120.7	8	120	66	79	72	84	75	86	0.4	0.5	0.5	0.5	0.5	0.5
DHS02	J-DHS10	J118	357.7	8	120	30	37	32	39	34	40	0.2	0.2	0.2	0.2	0.2	0.3
DHS03	J-DHS09	J-DHS07	571.8	8	120	16	9	18	10	17	6	0.1	0.1	0.1	0.1	0.1	0.0
DHS04	J-DHS07	J-DHS06	339.7	8	130	12	2	14	3	12	3	0.1	0.0	0.1	0.0	0.1	0.0
DHS05	J-DHS06	J-DHS05	191.2	8	130	9	5	11	4	8	11	0.1	0.0	0.1	0.0	0.1	0.1
DHS06	J-DHS05	J-DHS08	413.3	8	120	26	21	29	24	28	20	0.2	0.1	0.2	0.2	0.2	0.1
DHS07	J-DHS08	J-DHS10	538.4	8	120	33	35	36	38	37	37	0.2	0.2	0.2	0.2	0.2	0.2
DHS08	J-DHS05	J-DHS03	66.5	8	130	31	9	36	13	32	0	0.2	0.1	0.2	0.1	0.2	0.0
DHS09	J-DHS03	J-DHS04	32.7	8	130	189	128	194	130	173	112	1.2	0.8	1.2	0.8	1.1	0.7
DHS10	J-DHS03	J-DHS01	348.8	8	130	162	126	161	124	145	121	1.0	0.8	1.0	0.8	0.9	0.8
DHS11	J-DHS01	J-DHS02	453.5	8	120	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
DHS12	J-DHS01	J-WSTCOMM09	308.9	8	120	169	140	168	138	154	138	1.1	0.9	1.1	0.9	1.0	0.9
ESMER01	J-ESM/W-END	J-ESM/10TH01	93.5	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
ESMER02	J-ESM/10TH01	J-ESM/10TH02	12.7	6	120	112	114	112	114	108	117	1.3	1.3	1.3	1.3	1.2	1.3
ESMER03	J-ESM/10TH02	J-ESM/9TH	357.6	6	120	7	11	8	11	7	12	0.1	0.1	0.1	0.1	0.1	0.1
ESMER04	J-ESM/8TH	J-ESM/7TH	368.3	6	120	79	89	80	89	78	93	0.9	1.0	0.9	1.0	0.9	1.1
ESMER05	J-ESM/7TH	J-ESM/6TH	310.8	6	120	97	107	97	108	94	111	1.1	1.2	1.1	1.2	1.1	1.3
ESMER06	J-ESM/6TH	J-ESM/5TH	329.0	6	120	21	10	20	13	12	39	0.2	0.1	0.2	0.1	0.1	0.4
ESMER07	J-ESM/5TH	J-ESM/4TH	320.9	6	120	7	11	7	12	14	26	0.1	0.1	0.1	0.1	0.2	0.3
ESMER08	J-ESM/4TH	J-ESM/3RD	320.5	6	120	35	7	33	14	27	73	0.4	0.1	0.4	0.2	0.3	0.8
EVERGRN	J-CANT/EVRGRN	J-EVRGRN	111.5	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
FIORE	J-AZURE/FIORE	J-FIORE	153.7	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
FONTE	J-FONTE	J-GAL/FNTE	143.5	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
FOXGLV	J-FOXGLV	J-CANT/LIND	132.3	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
FOXTAIL01	J-MAHO/FOXTL	J-FXTL	119.6	4	130	4	7	4	7	4	9	0.1	0.2	0.1	0.2	0.1	0.2
FREIDA01	J-BOUG/FREIDA	J252	806.4	8	130	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.1	0.1
FRTREECT	J-TAM/FIR	J-FIRTREE	440.4	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
GALANTE01	J-AZURE/GAL	J-GAL/FNTE	170.7	8	130	113	144	113	148	134	172	0.7	0.9	0.7	0.9	0.9	1.1
GALANTE02	J-GAL/FNTE	J-GAL/ROSSO	208.0	8	130	120	158	121	162	142	189	0.8	1.0	0.8	1.0	0.9	1.2
GALANTE03	J-GAL/ROSSO	J-SANF/GAL	259.3	8	130	127	172	128	177	151	207	0.8	1.1	0.8	1.1	1.0	1.3
GILMAN01	J-HEY/GILMAN	J-GILMAN/S-END	322.9	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
GILMAN02	J-GILMAN/OXYOKE	J-HEY/GILMAN	399.8	8	130	5	11	5	11	7	13	0.0	0.1	0.0	0.1	0.0	0.1
GILMAN03	J-GILMAN/N-END	J-GILMAN/OXYOKE	129.7	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
HDNBRK01	J-LUCE/HDNBRK03	J-HDNBRK	527.2	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
HEARTH01	J210	J208	455.9	8	120	55	53	55	53	52	53	0.4	0.3	0.4	0.3	0.3	0.3
HEARTH02	J-39513	J-HEARTH01	444.3	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
HEARTH03	J-39511	J-HEARTH02	156.5	8	130	259	238	259	237	242	234	1.7	1.5	1.7	1.5	1.5	1.5
HEARTH04	J-HEARTH02	J-HEARTH03	207.2	8	130	131	117	131	117	121	113	0.8	0.7	0.8	0.7	0.8	0.7
HEARTH05	J-HEARTH04	J196	111.0	8	130	117	100	117	99	107	94	0.7	0.6	0.7	0.6	0.7	0.6
HEARTH06	J-HEARTH03	J-HEARTH04	180.6	8	130	60	51	60	51	55	49	0.4	0.3	0.4	0.3	0.4	0.3
HEARTH07	J-HEARTH04	J-HEARTH05	190.5	8	130	174	144	174	143	158	135	1.1	0.9	1.1	0.9	1.0	0.9
HEARTH08	J-LUCE/HEARTH01	J-LUCE/HEARTH02	26.1	8	130	161	136	161	135	147	128	1.0	0.9	1.0	0.9	0.9	0.8
HEARTH09	J-HEARTH05	J-LUCE/HEARTH01	108.7	8	130	89	101	90	101	89	108	0.6	0.6	0.6	0.6	0.6	0.7
HEARTH10	J-HEARTH05	J198	294.4	8	130	127	116	127	115	118	113	0.8	0.7	0.8	0.7	0.8	0.7
HEARTH11	J200	J202	171.6	8	130	129	116	129	116	120	112	0.8	0.7	0.8	0.7	0.8	0.7
HEARTH12	J-HEARTH08	J204	218.6	8	130	245	211	245	209	226	199	1.6	1.3	1.6	1.3	1.4	1.3
HEARTH13	J-HEARTH03	J-HEARTH06	228.8	4	130	67	59	67	58	62	56	1.7	1.5	1.7	1.5	1.6	1.4
HEARTH14	J66	J-HEARTH07	216.0	8	130	26	17	26	17	22	14	0.2	0.1	0.2	0.1	0.1	0.1
HEARTH15	J206	J-IRNWD/HEARTH01	316.5	8	130	19	3	19	3	14	4	0.1	0.0	0.1	0.0	0.1	0.0

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
HEARTH16	J72	J70	145.2	8	130	27	14	27	13	22	8	0.2	0.1	0.2	0.1	0.1	0.1
HEARTH17	J-IRNWD/HEARTH02	J-HEARTH09	106.8	8	130	20	0	20	1	14	9	0.1	0.0	0.1	0.0	0.1	0.1
HEARTH18	J-IRNWD/HEARTH01	J-HEARTH10	129.6	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
EYBOURNE	J-HEY/SNAFFLE01	J-HEY/SNAFFLE02	250.7	12	130	27	54	28	56	34	67	0.1	0.2	0.1	0.2	0.1	0.2
EYBOURNE	J-HEY/SNAFFLE02	J-HEY/LASSO	419.9	12	130	24	47	24	48	29	58	0.1	0.1	0.1	0.1	0.1	0.2
EYBOURNE	J-HEY/LASSO	J-HEY/GILMAN	416.7	12	130	16	32	16	32	19	39	0.0	0.1	0.0	0.1	0.1	0.1
EYBOURNE	J-HEY/GILMAN	J-HEY/E-END	142.9	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
HEYBRN01	J-MV/N-BOUND	J-LANT/N-BOUND	184.9	30	130	4729	4170	4732	4136	4463	3878	2.1	1.9	2.1	1.9	2.0	1.8
HEYBRN02	J-LANT/N-BOUND	J-WELL1002	1969.3	30	130	5203	4611	5205	4575	4923	4312	2.4	2.1	2.4	2.1	2.2	2.0
HEYBRN03	J-WELL1002	J-HEY/WELL1001	589.8	30	130	4797	5389	4795	5425	5077	5688	2.2	2.4	2.2	2.5	2.3	2.6
HEYBRN04	J-WELL1001	J-HEY/WELL1003	704.2	36	130	10000	10000	10000	10000	10000	10000	3.2	3.2	3.2	3.2	3.2	3.2
HEYBRN05	J-HEY/WELL1003	J-HEY/N-END	71.2	36	130	10000	10000	10000	10000	10000	10000	3.2	3.2	3.2	3.2	3.2	3.2
HEYBRN06	J-BUCK/HEY02	J-BUCK/HEY01	50.8	24	130	1005	2089	1011	2176	1796	3206	0.7	1.5	0.7	1.5	1.3	2.3
HEYBRN07	J-BUCK/HEY01	J-HEY/CHANTEL	494.8	24	130	4440	5008	4456	5072	4809	5539	3.1	3.6	3.2	3.6	3.4	3.9
HEYBRN08	J-HEY/CHANTEL	J-HEY/MONT01	840.3	24	130	4373	4934	4382	4986	4705	5383	3.1	3.5	3.1	3.5	3.3	3.8
HEYBRN09	J-HEY/MONT01	J-HEY/MONT02	71.1	24	130	4801	5396	4798	5432	5081	5697	3.4	3.8	3.4	3.9	3.6	4.0
HEYBRN10	J-HEY/MONT02	J-HEY/WELL1001	1192.5	24	130	4797	5389	4795	5425	5077	5688	3.4	3.8	3.4	3.8	3.6	4.0
HEYBRN11	J-HEY/WELL1001	J-HEY/WELL1002	302.4	24	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
HEYBRN12	J-HEY/WELL1002	J-HEY/EXPORT	305.2	24	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
HEYBRN13	J-HEY/WELL1003	J-HEY/WELL1002	74.1	24	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
HNYSKLE	J-WIST/HONEY	J-BOUG/HONEY	275.4	8	130	64	27	65	26	36	19	0.4	0.2	0.4	0.2	0.2	0.1
HTHRCR	J-TAM/HEATH	J-HEATHER	374.9	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
HWY8801	J-88/MACK	J-88/ASPNGRV	315.2	8	120	110	29	109	24	86	7	0.7	0.2	0.7	0.2	0.6	0.0
HWY8802	J-88/ASPNGRV	J-88/CR	622.8	8	130	140	80	140	77	120	67	0.9	0.5	0.9	0.5	0.8	0.4
HWY8803	J-88/CR	J122	273.6	8	130	243	217	247	220	232	216	1.5	1.4	1.6	1.4	1.5	1.4
HWY8804	J-HWY8804	J-HWY8805	136.1	8	120	169	124	168	122	148	113	1.1	0.8	1.1	0.8	0.9	0.7
HWY8805	J-HWY8805	J-HWY8806	408.9	8	120	36	46	42	50	47	49	0.2	0.3	0.3	0.3	0.3	0.3
HWY8806	J-HWY8806	J-HWY8807	228.6	8	120	138	110	136	105	123	95	0.9	0.7	0.9	0.7	0.8	0.6
HWYJCT	J168	J-39501	365.1	8	120	131	96	129	90	114	78	0.8	0.6	0.8	0.6	0.7	0.5
IRIS	J-IRIS	J-WIST/HONEY	297.9	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
IRNWD01	J-MAHO/IRNWD	J-IRNWD01	361.5	8	120	288	304	291	306	284	328	1.8	1.9	1.9	2.0	1.8	2.1
IRNWD02	J-IRNWD01	J-TAM/IRNWD	385.7	8	120	295	318	298	320	293	346	1.9	2.0	1.9	2.0	1.9	2.2
IRNWD03	J-TAM/IRNWD	J-IRNWD/PN01	646.1	6	120	222	211	225	212	214	219	2.5	2.4	2.6	2.4	2.4	2.5
IRNWD04	J-IRNWD/PN01	J-MGSD-END	587.7	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
IRNWD05	J-WSTCOMM03	J-395/IRNWD	394.6	12	130	841	674	864	686	799	664	2.4	1.9	2.5	1.9	2.3	1.9
IRNWD06	J-395/IRNWD	J-IRNWD02	421.8	12	130	527	410	504	384	452	341	1.5	1.2	1.4	1.1	1.3	1.0
IRNWD07	J-IRNWD03	J-IRNWD/CVMED	323.8	12	130	520	396	497	370	443	324	1.5	1.1	1.4	1.0	1.3	0.9
IRNWD08	J-IRNWD/CVMED	J228	158.3	12	130	499	354	475	327	417	272	1.4	1.0	1.3	0.9	1.2	0.8
IRNWD09	J-IRNWD04	J216	464.8	12	130	492	340	468	313	409	255	1.4	1.0	1.3	0.9	1.2	0.7
IRNWD10	J214	J-LUCE/IRNWD02	421.3	12	130	431	248	416	216	326	113	1.2	0.7	1.2	0.6	0.9	0.3
IRNWD11	J-LUCE/IRNWD02	J-LUCE/IRNWD01	25.4	12	130	359	210	347	184	274	98	1.0	0.6	1.0	0.5	0.8	0.3
IRNWD12	J-LUCE/IRNWD01	J-IRNWD/HEARTH03	182.8	12	130	52	81	52	80	56	89	0.1	0.2	0.1	0.2	0.2	0.3
IRNWD13	J-IRNWD/HEARTH03	J-IRNWD/HEARTH02	173.8	12	130	291	277	290	275	273	272	0.8	0.8	0.8	0.8	0.8	0.8
IRNWD14	J-IRNWD/HEARTH02	J-IRNWD/HEARTH01	104.5	12	130	9	18	8	19	1	29	0.0	0.1	0.0	0.1	0.0	0.1
IRNWD15	J-IRNWD/HEARTH01	J-IRNWD/E-END	66.7	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
IRNWD16	J212	J-LUCE/FIRESTA	287.9	12	130	313	245	311	241	279	216	0.9	0.7	0.9	0.7	0.8	0.6
IRNWD17	J-LUCE/FIRESTA	J-LUCE/FIRE01	96.2	12	130	309	238	308	234	275	207	0.9	0.7	0.9	0.7	0.8	0.6
IRNWD19	J-IRNWD/PN02	J-IRNWD/PN03	41.2	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
IRNWDCT	J-IRNWD01	J-IRNWDCT	141.3	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
CTCOMM0	J-JCTCOMM02	J192	288.5	8	130	110	92	109	89	102	81	0.7	0.6	0.7	0.6	0.7	0.5
CTCOMM0	J-JCTCOMM04	J-JCTCOMM03	114.0	8	130	16	21	17	22	17	23	0.1	0.1	0.1	0.1	0.1	0.1
CTCOMM0	J-JCTCOMM03	J-JCTCOMM01	277.2	8	130	150	146	151	145	145	140	1.0	0.9	1.0	0.9	0.9	0.9
CTCOMM0	J-JCTCOMM04	J-JCTCOMM05	555.3	8	130	119	99	119	97	110	87	0.8	0.6	0.8	0.6	0.7	0.6
CTCOMM0	J-JCTCOMM05	J-39501	181.3	8	130	59	44	60	43	55	35	0.4	0.3	0.4	0.3	0.4	0.2
CTCOMM0	J174	J-JCTCOMM05	279.5	8	130	56	48	55	46	51	43	0.4	0.3	0.4	0.3	0.3	0.3
CTCOMM0	J-JCTCOMM06	J-39506	218.8	8	130	155	102	154	97	136	74	1.0	0.7	1.0	0.6	0.9	0.5
CTCOMM0	J-MNDNTOWN04	J-JCTCOMM06	82.8	8	130	106	69	106	66	93	48	0.7	0.4	0.7	0.4	0.6	0.3
CTCOMM0	J184	J-MNDNTOWN05	300.8	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
CTCOMM1	J-MNDNTOWN01	J-MNDNTOWN04	151.6	8	130	117	90	116	87	106	74	0.7	0.6	0.7	0.6	0.7	0.5
CTCOMM1	J-MNDNTOWN02	J-MNDNTOWN01	23.1	8	130	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.1	0.1
CTCOMM1	J-MNDNTOWN02	J-MNDNTOWN03	381.3	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
CTCOMM1	J186	J-MNDNTOWN01	260.8	8	130	127	111	127	108	119	100	0.8	0.7	0.8	0.7	0.8	0.6
LABA01	J-BURR/LABA	J-LABA/BEHIA	329.2	6	120	27	3	26	3	18	1	0.3	0.0	0.3	0.0	0.2	0.0
LABA02	J-LABA/BEHIA	J-LABA/OULA	126.3	6	120	20	11	19	12	10	18	0.2	0.1	0.2	0.1	0.1	0.2
LABA03	J-LABA/OULA	J-LABA/E-END	128.7	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
LANT01	J-LUCE/LANT	J-LANT/WIST01	380.4	12	130	275	174	276	167	199	136	0.8	0.5	0.8	0.5	0.6	0.4
LANT02	J238	J-LANT/BOUG01	501.6	12	130	247	192	248	188	213	165	0.7	0.5	0.7	0.5	0.6	0.5
LANT03	J-LANT/BOUG01	J-LANT/N-BOUND	583.7	8	130	477	447	477	447	464	442	3.0	2.9	3.0	2.9	3.0	2.8
LANT04	J-LUCE/LANT	J-LANT/WIST02	227.1	12	130	159	396	160	409	305	485	0.5	1.1	0.5	1.2	0.9	1.4
LANT05	J-LANT/WIST02	J248	530.4	12	130	143	331	144	341	253	404	0.4	0.9	0.4	1.0	0.7	1.1
LANT06	J250	J-LANT/BOUG02	465.8	12	130	231	480	233	492	365	579	0.7	1.4	0.7	1.4	1.0	1.6
LASBRIS	J-AZURE/LASBRI	J-SANF/LASBRI	596.8	8	130	15	25	13	21	7	12	0.1	0.2	0.1	0.1	0.0	0.1
LASSO01	J-SNAFFLE/LASSO	J-LASSO/W-END	187.9	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
LASSO02	J-SNAFFLE/LASSO	J-LASSO01	460.2	8	130	8	15	8	16	9	19	0.0	0.1	0.1	0.1	0.1	0.1
LASSO03	J-LASSO01	J-HEY/LASSO	627.7	8	130	4	8	4	9	5	10	0.0	0.1	0.0	0.1	0.0	0.1
LASSO04	J-HEY/LASSO	J-OXYOKE/LASSO	316.8	8	130	9	17	9	18	11	21	0.1	0.1	0.1	0.1	0.1	0.1
LAVNDR01	J-CANT/TULIP	J-LAV	241.0	8	130	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.1	0.1
LAVNDR02	J-LAV	J-LAV/S-END	51.8	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
LIBRARY01	J-CR/LIB	J-LIBRARY	283.7	8	130	6	2	6	3	4	0	0.0	0.0	0.0	0.0	0.0	0.0
LIBRARY02	J-LIBRARY	J-ASPNGRV/LIB	138.6	6	130	9	9	9	10	8	9	0.1	0.1	0.1	0.1	0.1	0.1
LILAC	J-WIST/LILAC	J-LILAC	104.7	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
LINDEN01	J-CANT/LIND	J-LIND/BRCH	199.3	8	130	0	7	1	7	1	10	0.0	0.0	0.0	0.0	0.0	0.1
LINDEN02	J-LIND/BRCH	J-LIND	381.8	8	130	7	7	6	7	10	7	0.0	0.0	0.0	0.0	0.1	0.0
LINDEN03	J-LIND	J-LIND/N-END	385.3	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
LONGLF01	J-MAHO/LNGLF01	J-LNGLF01	286.8	6	130	64	50	65	50	59	48	0.7	0.6	0.7	0.6	0.7	0.5
LONGLF02	J102	J100	513.5	6	130	71	64	72	64	68	65	0.8	0.7	0.8	0.7	0.8	0.7
LPNCT	J-MAHO/LUP	J-LUPINE	252.4	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
LRCHWD01	J-MAHO/LARCH	J-LRCHWD	461.4	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
LUCE01	J-MACK/LUCE	J-ZALD/LUCE	299.9	8	120	4	26	3	28	1	35	0.0	0.2	0.0	0.2	0.0	0.2
LUCE02	J-ZALD/LUCE	J-BELAR/LUCE	287.4	8	120	17	49	16	51	16	63	0.1	0.3	0.1	0.3	0.1	0.4
LUCE03	J-BELAR/LUCE	J-CR/LUCE	293.0	6	120	58	73	59	74	61	84	0.7	0.8	0.7	0.8	0.7	1.0
LUCE04	J-LUCE/S-END	J-LUCE04	128.0	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
LUCE05	J-LUCE04	J-LUCE05	109.9	12	130	11	21	11	21	13	26	0.0	0.1	0.0	0.1	0.0	0.1
LUCE06	J-LUCE05	J-395/LUCE02	128.0	12	130	14	28	14	28	17	34	0.0	0.1	0.0	0.1	0.0	0.1
LUCE07	J-LUCE04	J-LUCE08	221.8	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
LUCE08	J-LUCE01	J-395/LUCE01	523.7	24	130	3351	3127	3357	3122	3148	3101	2.4	2.2	2.4	2.2	2.2	2.2
LUCE09	J-LUCE01	J-LUCE02	250.1	6	130	84	84	84	84	81	86	1.0	1.0	1.0	1.0	0.9	1.0
LUCE10	J-395/LUCE05	J-LUCE06	108.3	12	130	706	624	707	621	654	601	2.0	1.8	2.0	1.8	1.9	1.7

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			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
LUCE11	J-LUCE06	J-LUCE/HEARTH02	121.0	12	130	703	617	703	614	650	592	2.0	1.8	2.0	1.7	1.8	1.7
LUCE12	J-LUCE/HEARTH02	J-LUCE07	456.8	12	130	539	474	539	472	499	455	1.5	1.3	1.5	1.3	1.4	1.3
LUCE13	J-LUCE07	J-LUCE/IRNWD02	382.8	12	130	535	467	535	464	494	447	1.5	1.3	1.5	1.3	1.4	1.3
LUCE14	J-395/LUCE01	J-395/LUCE04	44.3	24	130	3319	3008	3322	2997	3095	2935	2.4	2.1	2.4	2.1	2.2	2.1
LUCE15	J-395/LUCE04	J-LUCE/HEARTH01	425.9	24	130	3285	2901	3286	2885	3042	2789	2.3	2.1	2.3	2.0	2.2	2.0
LUCE16	J-LUCE/HEARTH01	J-LUCE/IRNWD01	818.6	24	130	3353	2929	3353	2912	3096	2801	2.4	2.1	2.4	2.1	2.2	2.0
LUCE17	J-LUCE/IRNWD02	J-LUCE/FIRE02	216.5	12	130	604	498	601	490	543	453	1.7	1.4	1.7	1.4	1.5	1.3
LUCE18	J222	J-LUCE/MV01	435.6	12	130	605	500	601	492	546	460	1.7	1.4	1.7	1.4	1.5	1.3
LUCE19	J-LUCE/MV01	J-LUCE/HDNBRK02	84.8	12	130	906	709	920	705	807	588	2.6	2.0	2.6	2.0	2.3	1.7
LUCE20	J-LUCE/HDNBRK03	J-LUCE/LANT	161.1	12	130	120	215	120	234	102	341	0.3	0.6	0.3	0.7	0.3	1.0
LUCE21	J-LUCE/IRNWD01	J-LUCE/FIRE01	215.3	24	130	3657	3052	3645	3008	3309	2801	2.6	2.2	2.6	2.1	2.3	2.0
LUCE22	J-LUCE/FIRE01	J-LUCE/HDNBRK01	989.5	24	130	3950	3260	3938	3211	3564	2967	2.8	2.3	2.8	2.3	2.5	2.1
LUCE23	J-LUCE/HDNBRK01	J-LUCE/HDNBRK02	19.9	24	130	3950	3260	3938	3211	3564	2967	2.8	2.3	2.8	2.3	2.5	2.1
LUCE24	J-LUCE/HDNBRK02	J-MV/N-BOUND	1910.3	24	130	4729	4170	4732	4136	4463	3878	3.4	3.0	3.4	2.9	3.2	2.8
LUCE25	J-LUCE/FIRE01	J-LUCE/FIRE02	25.4	12	130	12	23	11	24	16	33	0.0	0.1	0.0	0.1	0.0	0.1
MACK01	J-88/MACK	J-MACK/BURR	337.1	8	120	107	22	105	17	82	2	0.7	0.1	0.7	0.1	0.5	0.0
MACK02	J-MACK/BURR	J-MACK/OULA	579.2	8	120	70	2	69	7	51	27	0.4	0.0	0.4	0.0	0.3	0.2
MACK03	J-MACK/OULA	J-MACK/LUCE	393.8	8	120	44	45	43	49	23	66	0.3	0.3	0.3	0.3	0.1	0.4
MACK04	J-MACK/LUCE	J142	505.0	10	130	45	26	42	29	18	40	0.2	0.1	0.2	0.1	0.1	0.2
MACK05	J-MACK/10TH	J-MACK/E-END	112.0	10	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
MAHO1	J-88/CR	J-MAHO01	397.9	10	130	471	361	474	358	430	344	1.9	1.5	1.9	1.5	1.8	1.4
MAHO10	J-MAHO/WSTWD	J-MAHO/IRNWD	298.4	8	120	265	242	267	242	252	248	1.7	1.5	1.7	1.5	1.6	1.6
MAHO11	J-MAHO/IRNWD	J-MAHO/CDRWD	282.0	6	120	20	56	20	57	28	71	0.2	0.6	0.2	0.6	0.3	0.8
MAHO12	J-MAHO/CDRWD	J-MAHO/WSTWD02	400.1	6	120	31	6	32	5	25	4	0.4	0.1	0.4	0.1	0.3	0.0
MAHO13	J-MAHO/WSTWD02	J-MAHO/LUP	388.2	6	120	29	10	29	10	24	4	0.3	0.1	0.3	0.1	0.3	0.0
MAHO14	J-MAHO/LUP	J-MAHO/TAM	302.1	6	120	36	24	37	24	33	21	0.4	0.3	0.4	0.3	0.4	0.2
MAHO2	J44	J-MAHO02	163.7	10	130	343	281	345	279	318	276	1.4	1.1	1.4	1.1	1.3	1.1
MAHO3	J-MAHO02	J120	524.3	10	130	495	410	499	408	460	404	2.0	1.7	2.0	1.7	1.9	1.7
MAHO4	J-MAHO/LNGLF01	J-MAHO/WSTWD01	110.8	10	130	438	373	442	372	410	373	1.8	1.5	1.8	1.5	1.7	1.5
MAHO5	J-MAHO/WSTWD01	J-MAHO/BRIST	324.9	10	130	321	278	323	277	301	280	1.3	1.1	1.3	1.1	1.2	1.1
MAHO6	J-MAHO/BRIST	J-MAHO/FOXTL	332.7	10	130	328	292	330	292	310	297	1.3	1.2	1.4	1.2	1.3	1.2
MAHO7	J-MAHO/FOXTL	J-MAHOLNGLF02	337.0	10	130	335	306	338	306	318	314	1.4	1.3	1.4	1.3	1.3	1.3
MAHO8	J-MAHOLNGLF02	J-MAHO/LARCH	272.6	10	130	413	384	417	384	394	397	1.7	1.6	1.7	1.6	1.6	1.6
MAHO9	J-MAHO/LARCH	J-MAHO/WSTWD	250.7	8	120	420	398	424	398	403	414	2.7	2.5	2.7	2.5	2.6	2.6
MAHOCR01	J-MAHOCIR	J-MAHO/TAM	562.7	6	130	12	7	13	7	11	6	0.1	0.1	0.1	0.1	0.1	0.1
MAHOCR02	J84	J-MAHOCIR	295.6	6	130	16	14	16	14	15	14	0.2	0.2	0.2	0.2	0.2	0.2
MONO01	J-MONO/10TH	J152	394.1	6	120	65	67	65	67	61	68	0.7	0.8	0.7	0.8	0.7	0.8
MONO02	J-MONO/8TH	J154	371.6	6	120	86	93	87	93	82	96	1.0	1.1	1.0	1.1	0.9	1.1
MONO03	J-MONO/6TH	J-MONO/5TH	324.9	6	120	55	38	54	36	32	1	0.6	0.4	0.6	0.4	0.4	0.0
MONO04	J160	J-MONO/3RD	373.2	6	120	9	18	5	22	32	62	0.1	0.2	0.1	0.2	0.4	0.7
MONO05	J-MONO/3RD	J-MONO/2ND	318.9	6	120	15	28	18	30	36	52	0.2	0.3	0.2	0.3	0.4	0.6
MONO06	J-MONO/2ND	J-MONO/39501	319.4	6	120	22	32	18	41	70	105	0.3	0.4	0.2	0.5	0.8	1.2
MONT01	J-HEY/MONT01	J-AZURE/MNTRRA	300.9	10	130	431	470	420	453	381	322	1.8	1.9	1.7	1.9	1.6	1.3
MONT02	J-AZURE/MNTRRA	J-SANF/MNTRRA	569.5	10	130	232	257	223	240	178	115	0.9	1.0	0.9	1.0	0.7	0.5
MONT03	J-SANF/MNTRRA	J-ARB/MNTRRA	574.5	10	130	45	44	48	50	66	79	0.2	0.2	0.2	0.2	0.3	0.3
MONT04	J-SANF/MNTCTO	J266	336.2	8	130	47	57	44	50	24	8	0.3	0.4	0.3	0.3	0.2	0.1
MONT05	J268	J-SANF/MNTCTO	334.8	8	130	59	72	62	78	83	114	0.4	0.5	0.4	0.5	0.5	0.7
MONT06	J-AZURE/MNTRRACT	J-MNTRRA	155.1	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
MONT07	J-MONTI	J-AZURE/GAL	129.7	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow						Velocity					
						EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
MPLWD01	J94	J-OAKWD/MPL	514.9	6	120	60	60	61	60	59	64	0.7	0.7	0.7	0.7	0.7	0.7
MRNGLRY	J-WIST/MRNGLRY	J-BOUG/MRNGLRY	262.1	8	130	41	116	41	119	85	143	0.3	0.7	0.3	0.8	0.5	0.9
MV01	J-IRNWD/MV	J-MV01	314.9	8	130	50	71	41	75	69	117	0.3	0.5	0.3	0.5	0.4	0.7
MV02	J-MV01	J218	397.8	8	130	50	71	41	75	69	117	0.3	0.5	0.3	0.5	0.4	0.7
MV03	J-MV02	J-MV03	733.6	8	130	101	67	72	37	49	8	0.6	0.4	0.5	0.2	0.3	0.1
MV04	J-MV03	J-N-BOUND/MV	274.0	8	130	296	229	207	157	186	145	1.9	1.5	1.3	1.0	1.2	0.9
MV05	J-N-BOUND/MV	J-MV04	425.5	8	130			137	111	136	127			0.9	0.7	0.9	0.8
MV06	J-MV04	J-MV/N-END	246.8	8	130			2	4	8	17			0.0	0.0	0.1	0.1
MV07	J-MV04	J-MV16	366.1	8	130			132	103	119	93			0.8	0.7	0.8	0.6
MV08	J-MV16	J230	615.7	8	130			64	48	55	36			0.4	0.3	0.3	0.2
MV09	J-MV12	J-MV07	731.1	8	130	114	80	140	94	112	55	0.7	0.5	0.9	0.6	0.7	0.4
MV10	J-MV07	J-LUCE/MV01	419.6	8	130	305	216	323	220	265	137	1.9	1.4	2.1	1.4	1.7	0.9
MV11	J-MV06	J-MV05	260.1	8	130	54	26	84	42	53	9	0.3	0.2	0.5	0.3	0.3	0.1
MV12	J-MV09	J-MV06	513.4	8	130	15	17	38	21	22	12	0.1	0.1	0.2	0.1	0.1	0.1
MV13	J236	J-MV08	389.9	8	130	76	57	53	35	39	20	0.5	0.4	0.3	0.2	0.3	0.1
MV14	J-MV11	J-MV09	89.4	8	130	121	94	4	8	16	36	0.8	0.6	0.0	0.0	0.1	0.2
MV15	J-MV14	J-MV11	126.9	8	130			81	57	58	17			0.5	0.4	0.4	0.1
MV16	J234	J-MV14	256.1	8	130			39	27	27	6			0.3	0.2	0.2	0.0
MV17	J-MV08	J-MV10	89.5	8	130	189	148	102	78	86	61	1.2	0.9	0.7	0.5	0.5	0.4
MV18	J-MV10	J-MV13	141.5	8	130			26	28	43	59			0.2	0.2	0.3	0.4
MV19	J-MV13	J232	295.1	8	130			20	11	4	16			0.1	0.1	0.0	0.1
MV20	J-MV16	J-MV15	210.6	8	130			66	51	56	41			0.4	0.3	0.4	0.3
MV21	J-MV02	J-MV05	401.6	8	130	144	124	107	98	109	108	0.9	0.8	0.7	0.6	0.7	0.7
MV22	J-MV05	J-MV07	395.3	8	130	194	143	187	133	158	90	1.2	0.9	1.2	0.8	1.0	0.6
MV23	J-MV08	J-MV09	257.0	8	130	110	84	46	36	42	32	0.7	0.5	0.3	0.2	0.3	0.2
MV24	J-MV03	J-MV10	258.0	8	130	192	155	131	113	133	129	1.2	1.0	0.8	0.7	0.9	0.8
MV25	J-MV11	J-MV12	260.4	8	130	118	87	81	58	70	44	0.8	0.6	0.5	0.4	0.4	0.3
MV26	J-MV13	J-MV14	263.0	8	130			44	34	39	27			0.3	0.2	0.2	0.2
OAKWD01	J-WSTWD/OAKWD	J-OAKWD/MPL	266.3	6	120	4	12	4	12	0	18	0.0	0.1	0.0	0.1	0.0	0.2
OAKWD02	J-OAKWD/MPL	J-OAKWD01	172.5	6	120	60	79	61	80	63	90	0.7	0.9	0.7	0.9	0.7	1.0
OAKWD03	J-OAKWD01	J-MAHO/WSTWD	221.6	8	120	64	86	65	87	68	98	0.4	0.5	0.4	0.6	0.4	0.6
OAKWD04	J92	J-TAM/OAKWD	498.1	8	120	226	256	228	258	227	281	1.4	1.6	1.5	1.6	1.5	1.8
OULA01	J-LABA/OULA	J-MACK/OULA	468.5	8	120	13	25	12	26	1	35	0.1	0.2	0.1	0.2	0.0	0.2
OULA02	J-MACK/OULA	J-ZALD/OULA	373.6	8	120	34	11	34	9	25	4	0.2	0.1	0.2	0.1	0.2	0.0
OULA03	J-ZALD/OULA	J-BELAR/OULA	408.9	8	120	20	25	20	25	23	16	0.1	0.2	0.1	0.2	0.1	0.1
OULA04	J-BELAR/OULA	J-CR/OULA	373.3	8	120	9	71	15	73	38	74	0.1	0.5	0.1	0.5	0.2	0.5
OXYOKE01	J-OXYOKE/W-END	J-OXYOKE/LASSO	343.9	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
OXYOKE02	J-OXYOKE/LASSO	J-GILMAN/OXYOKE	329.8	8	130	2	3	2	3	2	4	0.0	0.0	0.0	0.0	0.0	0.0
P101	J72	J76	92.7	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P103	J-HEARTH09	J74	92.3	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P105	J-TAM/MAHOCIR	J84	209.0	6	130	19	21	20	22	20	23	0.2	0.2	0.2	0.2	0.2	0.3
P107	J-MAHO/WSTWD02	J86	231.8	6	120	61	55	61	55	58	57	0.7	0.6	0.7	0.6	0.7	0.6
P109	J88	J-MAHO/WSTWD02	236.0	6	120	55	53	56	53	53	56	0.6	0.6	0.6	0.6	0.6	0.6
P111	J90	J-SHMRK	275.5	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P113	J-MAHO/WSTWD	J92	361.5	8	120	223	249	225	251	223	273	1.4	1.6	1.4	1.6	1.4	1.7
P115	J-WSTWD/MPL	J94	240.6	6	120	57	53	57	53	54	55	0.6	0.6	0.7	0.6	0.6	0.6
P117	J96	J-WSTWD/MPL	441.3	6	130	128	116	129	116	122	119	1.5	1.3	1.5	1.3	1.4	1.3
P119	J-MAHO/WSTWD01	J98	267.3	6	130	121	102	122	102	113	102	1.4	1.2	1.4	1.2	1.3	1.2
P121	J100	J-MAHOLNGLF02	461.3	6	130	75	71	75	71	72	74	0.8	0.8	0.9	0.8	0.8	0.8

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
P123	J-LNGLF01	J102	443.9	6	130	68	57	68	57	63	57	0.8	0.6	0.8	0.6	0.7	0.6
P125	J-WSTCOMM02	J104	185.5	8	130	98	106	96	105	94	114	0.6	0.7	0.6	0.7	0.6	0.7
P127	J-WSTCOMM06	J106	258.6	8	130	148	114	151	115	138	110	0.9	0.7	1.0	0.7	0.9	0.7
P129	J108	J-WSTCOMM06	177.7	8	130	62	64	61	63	59	68	0.4	0.4	0.4	0.4	0.4	0.4
P13	J-BUCK/WELL0902	J10	8.7	16	130	14	28	14	28	17	34	0.0	0.0	0.0	0.0	0.0	0.1
P131	J-WSTCOMM09	J110	209.2	8	130	55	50	54	49	50	51	0.4	0.3	0.3	0.3	0.3	0.3
P133	J-WSTCOMM08	J112	45.6	8	130	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.1	0.1
P135	J114	J-DHS09	246.6	8	120	19	16	21	17	21	14	0.1	0.1	0.1	0.1	0.1	0.1
P137	J116	J114	248.7	8	120	23	23	25	25	25	23	0.1	0.1	0.2	0.2	0.2	0.1
P139	J118	J116	157.2	8	120	26	30	28	32	30	31	0.2	0.2	0.2	0.2	0.2	0.2
P141	J120	J-MAHO/LNGLF01	460.1	10	130	499	417	503	415	464	413	2.0	1.7	2.1	1.7	1.9	1.7
P143	J122	J-HWY8804	246.8	8	130	239	210	244	213	228	208	1.5	1.3	1.6	1.4	1.5	1.3
P145	J124	J46	166.2	8	130	7	10	7	10	7	11	0.0	0.1	0.0	0.1	0.0	0.1
P147	J126	J-ASPNGRV	238.2	8	130	13	20	13	21	14	24	0.1	0.1	0.1	0.1	0.1	0.2
P149	J-88/CR	J128	174.7	6	130	84	56	84	55	74	52	1.0	0.6	1.0	0.6	0.8	0.6
P15	J10	J-BUCK/WELL0903	106.1	24	130	365	1431	365	1557	961	3023	0.3	1.0	0.3	1.1	0.7	2.1
P151	J128	J130	68.9	6	130	81	49	80	47	69	43	0.9	0.6	0.9	0.5	0.8	0.5
P153	J-CR/LIB	J132	217.4	6	130	80	37	79	36	64	26	0.9	0.4	0.9	0.4	0.7	0.3
P155	J-JCTCOMM01	J134	166.5	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
P157	J136	J-BELAR/LUCE	246.3	8	120	4	59	2	62	24	75	0.0	0.4	0.0	0.4	0.2	0.5
P159	J-BELAR/LUCE	J138	225.1	8	120	41	43	38	46	16	62	0.3	0.3	0.2	0.3	0.1	0.4
P161	J-ZALD01	J140	285.4	6	130	17	12	16	13	6	18	0.2	0.1	0.2	0.2	0.1	0.2
P163	J142	J-MACK/10TH	225.3	10	130	41	33	39	36	13	48	0.2	0.1	0.2	0.1	0.1	0.2
P165	J-395/LUCE03	J144	132.8	8	120	155	140	155	139	143	136	1.0	0.9	1.0	0.9	0.9	0.9
P-165	J-CR/OULA	J-JCTCOMM01	313.8	8	110	148	201	155	205	171	208	0.9	1.3	1.0	1.3	1.1	1.3
P-166	J-JCTCOMM01	J188	485.0	8	110	9	42	3	46	18	50	0.1	0.3	0.0	0.3	0.1	0.3
P167	J146	J-LUCE01	273.5	24	130	3439	3217	3445	3213	3234	3196	2.4	2.3	2.4	2.3	2.3	2.3
P-167	J-JCTCOMM02	J-HWY8805	127.5	8	110	130	71	123	64	97	56	0.8	0.5	0.8	0.4	0.6	0.4
P169	J-BUCK/WTR02	J148	160.7	16	130	1763	1242	1764	1203	1460	902	2.8	2.0	2.8	1.9	2.3	1.4
P17	J-BUCK/ORB02	J-BUCK/ORB01	51.1	16	130	709	444	708	424	613	79	1.1	0.7	1.1	0.7	1.0	0.1
P171	J150	J-CR/8TH	332.6	8	120	129	141	130	142	117	140	0.8	0.9	0.8	0.9	0.7	0.9
P173	J152	J-MONO/8TH	335.9	6	120	68	74	68	74	65	76	0.8	0.8	0.8	0.8	0.7	0.9
P175	J154	J-MONO/6TH	309.3	6	120	90	100	90	101	87	104	1.0	1.1	1.0	1.1	1.0	1.2
P177	J-WLDRS/7TH	J156	628.6	6	120	23	2	21	5	10	43	0.3	0.0	0.2	0.1	0.1	0.5
P179	J-BNTLYHER02	J158	253.3	8	130	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.1	0.1
P181	J-MONO/5TH	J160	266.9	6	120	5	25	1	29	37	70	0.1	0.3	0.0	0.3	0.4	0.8
P185	J156	J164	356.7	6	120	26	5	25	2	5	35	0.3	0.1	0.3	0.0	0.1	0.4
P187	J164	J166	286.3	6	120	30	12	29	9	1	26	0.3	0.1	0.3	0.1	0.0	0.3
P189	J-HWY8807	J168	230.3	8	120	135	103	132	97	119	86	0.9	0.7	0.8	0.6	0.8	0.6
P19	J-568	J-BUCK03	2487.9	30	130	1005	2089	1011	2176	1796	3206	0.5	0.9	0.5	1.0	0.8	1.5
P191	J-39503	J170	175.5	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P193	J-39502	J172	142.5	8	120	40	26	39	24	34	19	0.3	0.2	0.3	0.2	0.2	0.1
P195	J-JCTCOMM06	J174	191.0	8	130	52	41	52	39	47	34	0.3	0.3	0.3	0.2	0.3	0.2
P197	J-39507	J176	215.7	8	130	126	65	124	60	105	34	0.8	0.4	0.8	0.4	0.7	0.2
P199	J-39510	J178	246.0	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P201	J-39508	J180	197.6	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P203	J-39506	J182	255.9	8	120	188	114	186	107	161	76	1.2	0.7	1.2	0.7	1.0	0.5
P205	J-MNDNTOWN04	J184	136.3	8	130	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.1	0.1
P207	J-JCTCOMM03	J186	131.6	8	130	131	118	131	115	123	108	0.8	0.8	0.8	0.7	0.8	0.7

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			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
P209	J188	J-JCTCOMM02	83.0	8	110	16	28	10	31	9	33	0.1	0.2	0.1	0.2	0.1	0.2
P21	J-548	J-BUCK02	2486.9	16	130	695	1422	700	1480	1233	2195	1.1	2.3	1.1	2.4	2.0	3.5
P211	J188	J190	213.2	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P213	J192	J-JCTCOMM04	234.8	8	130	106	85	106	81	98	72	0.7	0.5	0.7	0.5	0.6	0.5
P215	J194	J-HEARTH02	131.4	8	130	124	114	124	114	116	112	0.8	0.7	0.8	0.7	0.7	0.7
P217	J196	J194	46.6	8	130	121	107	121	106	112	103	0.8	0.7	0.8	0.7	0.7	0.7
P219	J198	J-HEARTH08	149.9	8	130	123	109	123	108	114	104	0.8	0.7	0.8	0.7	0.7	0.7
P221	J-HEARTH08	J200	94.3	8	130	126	109	126	108	116	104	0.8	0.7	0.8	0.7	0.7	0.7
P223	J202	J-HEARTH05	151.4	8	130	133	123	133	123	125	121	0.8	0.8	0.8	0.8	0.8	0.8
P225	J204	J-IRNWD/HEARTH03	133.3	8	130	242	204	242	202	221	191	1.5	1.3	1.5	1.3	1.4	1.2
P227	J208	J-39514	356.5	8	120	52	46	52	46	48	44	0.3	0.3	0.3	0.3	0.3	0.3
P229	J-CVI02	J210	223.5	8	120	59	60	59	60	56	61	0.4	0.4	0.4	0.4	0.4	0.4
P23	J-LUCE02	J-395/LUCE03	61.2	8	130	77	70	77	70	72	68	0.5	0.4	0.5	0.4	0.5	0.4
P231	J-IRNWD/HEARTH02	J212	156.0	12	130	316	252	315	248	283	225	0.9	0.7	0.9	0.7	0.8	0.6
P233	J-IRNWD/MV	J214	168.5	12	130	435	255	420	223	331	121	1.2	0.7	1.2	0.6	0.9	0.3
P235	J216	J-IRNWD/MV	270.4	12	130	488	333	465	306	404	247	1.4	0.9	1.3	0.9	1.1	0.7
P237	J218	J-MV02	301.8	8	130	47	64	38	68	65	108	0.3	0.4	0.2	0.4	0.4	0.7
P239	J-LUCE/FIRE02	J220	336.2	12	130	612	514	608	506	555	477	1.7	1.5	1.7	1.4	1.6	1.4
P241	J220	J222	154.5	12	130	608	507	604	499	550	469	1.7	1.4	1.7	1.4	1.6	1.3
P243	J-CVMED01	J224	288.3	12	130	6	12	6	12	7	15	0.0	0.0	0.0	0.0	0.0	0.0
P245	J226	J-CVMED02	130.3	12	130	1	2	1	2	1	2	0.0	0.0	0.0	0.0	0.0	0.0
P247	J-IRNWD02	J-IRNWD03	81.2	12	130	523	403	500	377	447	333	1.5	1.1	1.4	1.1	1.3	0.9
P249	J228	J-IRNWD04	144.7	12	130	495	347	472	320	413	264	1.4	1.0	1.3	0.9	1.2	0.7
P25	J-LUCE02	J-LUCE03	47.1	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
P251	J230	J-MV12	418.9	8	130			62	43	46	20			0.4	0.3	0.3	0.1
P253	J232	J-MV15	146.4	8	130			22	15	13	1			0.1	0.1	0.1	0.0
P255	J-MV15	J234	184.8	8	130			41	32	35	23			0.3	0.2	0.2	0.1
P257	J-MV06	J236	100.6	8	130	72	50	49	28	35	12	0.5	0.3	0.3	0.2	0.2	0.1
P259	J-LANT/WIST01	J238	445.5	12	130	251	199	251	195	218	173	0.7	0.6	0.7	0.6	0.6	0.5
P261	J240	J-WHTOAK	287.7	8	130	17	24	17	24	20	27	0.1	0.2	0.1	0.2	0.1	0.2
P263	J-LANT/WIST01	J242	417.2	8	130	21	32	21	35	23	46	0.1	0.2	0.1	0.2	0.1	0.3
P265	J244	J-WIST/CAM	365.9	8	130	64	101	65	103	85	117	0.4	0.6	0.4	0.7	0.5	0.7
P267	J246	J-LANT/WIST02	341.1	8	130	23	79	23	82	61	98	0.1	0.5	0.1	0.5	0.4	0.6
P269	J248	J-LANT/VERB	478.4	12	130	147	338	148	348	257	413	0.4	1.0	0.4	1.0	0.7	1.2
P27	J-395/LUCE02	J-395/LUCE05	44.1	12	130	410	358	410	356	378	343	1.2	1.0	1.2	1.0	1.1	1.0
P271	J-LANT/VERB	J250	388.0	12	130	228	473	230	485	360	571	0.6	1.3	0.7	1.4	1.0	1.6
P273	J252	J-FREIDA/W-END	518.2	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
P275	J-MONO/39504	J254	198.0	12	130	68	135	82	164	335	453	0.2	0.4	0.2	0.5	1.0	1.3
P277	J-ZERO02	J256	454.2	12	130	56	112	79	157	331	445	0.2	0.3	0.2	0.4	0.9	1.3
P279	J258	J-WLDRS/2ND	163.6	6	120	37	26	36	23	8	9	0.4	0.3	0.4	0.3	0.1	0.1
P281	J260	J-DES/2ND	288.3	8	110	10	21	11	21	13	26	0.1	0.1	0.1	0.1	0.1	0.2
P283	J262	J-395/E-END	146.2	4	120	11	3	11	1	7	10	0.3	0.1	0.3	0.0	0.2	0.2
P285	J-395/E-END	J264	147.2	4	130	4	7	4	7	4	9	0.1	0.2	0.1	0.2	0.1	0.2
P287	J266	J-AZURE/MNTCTO	263.1	8	130	44	50	40	43	20	1	0.3	0.3	0.3	0.3	0.1	0.0
P289	J-ARB/MNTCTO	J268	210.6	8	130	56	65	58	71	79	105	0.4	0.4	0.4	0.5	0.5	0.7
P29	J-PNWD01	J12	237.3	8	120	352	324	355	324	335	333	2.2	2.1	2.3	2.1	2.1	2.1
P291	J270	J-MES01	404.3	8	130	8	15	8	16	9	19	0.0	0.1	0.1	0.1	0.1	0.1
P293	J-MES03	J272	217.3	8	130	3	6	3	6	3	7	0.0	0.0	0.0	0.0	0.0	0.0
P295	J274	J-BUCK/SANF	87.7	10	130	501	668	506	688	601	814	2.0	2.7	2.1	2.8	2.5	3.3

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
P297	J256	J276	469.0	12	130	56	112	79	157	331	445	0.2	0.3	0.2	0.4	0.9	1.3
P299	J276	J278	494.7	12	130	56	112	57	114	69	137	0.2	0.3	0.2	0.3	0.2	0.4
P301	J278	J280	479.3	12	130	56	112	57	114	69	137	0.2	0.3	0.2	0.3	0.2	0.4
P303	J282	J-HEY/SNAFFLE01	200.6	12	130	53	105	54	107	65	129	0.1	0.3	0.2	0.3	0.2	0.4
P305	J-BENTPKWY01	J286	139.2	6	130	7	14	7	14	9	17	0.1	0.2	0.1	0.2	0.1	0.2
P307	J286	J284	179.3	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P309	J288	J-BENTPKWY01	167.7	12	130	74	147	75	150	90	180	0.2	0.4	0.2	0.4	0.3	0.5
P31	J12	J14	182.2	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P311	J290	J-BENTPKWY/VECT	480.7	12	130	60	119	61	121	73	146	0.2	0.3	0.2	0.3	0.2	0.4
P313	J292	J-SP22	318.5	10	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
P315	J294	J-SP14	89.7	10	130	6	11	6	12	7	14	0.0	0.0	0.0	0.0	0.0	0.1
P317	J296	J-BENT01	180.0	8	130	11	22	11	23	14	27	0.1	0.1	0.1	0.1	0.1	0.2
P319	J298	J296	176.5	8	130	8	15	8	16	9	19	0.0	0.1	0.1	0.1	0.1	0.1
P321	J300	J298	320.9	8	130	4	8	4	8	5	10	0.0	0.1	0.0	0.1	0.0	0.1
P323	J302	J-BENT04	150.7	12	130	10	20	10	20	12	24	0.0	0.1	0.0	0.1	0.0	0.1
P325	J-BENT04	J304	149.3	12	130	13	27	14	27	16	33	0.0	0.1	0.0	0.1	0.0	0.1
P327	J-ORCH01	J306	172.2	8	130	3	5	3	6	3	7	0.0	0.0	0.0	0.0	0.0	0.0
P329	J308	J-BENTPKWY/ORCH	349.7	12	130	10	19	10	20	12	24	0.0	0.1	0.0	0.1	0.0	0.1
P33	J-DHS06	J16	129.4	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P331	J310	J308	237.4	12	130	13	26	13	27	16	32	0.0	0.1	0.0	0.1	0.0	0.1
P333	J-BUCK10	J312	477.6	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P335	J312	J314	894.5	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P337	J316	J-E.VLY/AMBER	352.8	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P339	J-E.VLY/AMBER	J318	514.1	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P341	J318	J320	518.6	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P343	J320	J322	366.6	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P345	J322	J324	449.0	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P347	J-AMBER	J326	1505.8	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P349	RES9000	U7000	200.0	10	110	1973	1974	1985	1979	1947	2042	8.1	8.1	8.1	8.1	8.0	8.3
P35	J-DHS08	J18	170.1	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P351	U7000	J62	5.0	12	110	1973	1974	1985	1979	1947	2042	5.6	5.6	5.6	5.6	5.5	5.8
P353	J328	J-550	29.3	24	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P355	J-556	J330	22.4	12	130	0	1859	0	2005	1381	3742	0.0	5.3	0.0	5.7	3.9	10.6
P359	J276	J332	1930.1	8	130			22	43	262	307			0.1	0.3	1.7	2.0
P361	J332	J-BUCK/BOUG02	2180.5	8	130					124	325					0.8	2.1
P363	J332	J-BUCK/SANF	1686.4	8	130					128	393					0.8	2.5
P365	J-SANF/MNTRRA	J334	1228.6	10	130			22	43	157	313			0.1	0.2	0.6	1.3
P367	R-WELL8	PMP-WELL8	32.2	16	130	1280	1284	1280	1285	1283	1296	2.0	2.0	2.0	2.1	2.0	2.1
P369	PMP-WELL9	J-571	64.7	6	130	1711	1673	1722	1674	1660	1685	19.4	19.0	19.5	19.0	18.8	19.1
P37	J-DHS09	J20	86.4	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P371	R-WELL5	PMP-WELL5	24.9	12	130	2072	2060	2087	2065	2031	2136	5.9	5.8	5.9	5.9	5.8	6.1
P373	J-WELL1002	J-WELL1001	302.6	30	130	10000	10000	10000	10000	10000	10000	4.5	4.5	4.5	4.5	4.5	4.5
P39	J112	J22	114.6	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
P41	J24	J30	68.6	10	130	77	44	89	54	84	40	0.3	0.2	0.4	0.2	0.3	0.2
P-427	J-LUCE/HDNBRK02	J-LUCE/HDNBRK03	24.2	6	110	127	201	127	220	93	324	1.4	2.3	1.4	2.5	1.1	3.7
P43	J30	J-WSTCOMM07	42.4	10	130	73	37	86	47	80	31	0.3	0.2	0.3	0.2	0.3	0.1
P45	J30	J28	58.7	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-464	J-LANT/WIST02	J-MARIGOLD	114.1	6	110	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P47	J24	J26	62.8	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
P49	J-MAHO01	J32	319.7	8	130	146	115	147	114	134	111	0.9	0.7	0.9	0.7	0.9	0.7
P51	J32	J-MAHO02	248.1	8	130	149	122	150	121	138	120	1.0	0.8	1.0	0.8	0.9	0.8
P53	J-MAHO01	J34	61.2	10	130	329	253	331	251	300	242	1.3	1.0	1.4	1.0	1.2	1.0
P-533	J-ARB/MNTRRA	J-MNTRRA/E-END	116.8	6	110	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P55	J34	J38	178.6	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P57	J38	J36	160.7	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P59	J38	J40	71.9	4	130	4	7	4	7	4	9	0.1	0.2	0.1	0.2	0.1	0.2
P61	J34	J44	137.2	10	130	336	267	338	265	309	259	1.4	1.1	1.4	1.1	1.3	1.1
P63	J44	J42	377.4	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
P65	J46	J-ASPNGRV/LIB	271.8	8	130	4	3	4	3	3	2	0.0	0.0	0.0	0.0	0.0	0.0
P67	J46	J48	104.2	4	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-682	J-SP08	J-SP07	19.4	6	130	11	21	11	21	13	26	0.1	0.2	0.1	0.2	0.1	0.3
P69	J-C.ALLEY/8TH	J50	18.5	6	120	90	92	90	92	86	93	1.0	1.0	1.0	1.0	1.0	1.1
P-707	J-538	J-544	117.0	16	130	0	1859	0	2005	1381	3742	0.0	3.0	0.0	3.2	2.2	6.0
P71	J-395/8TH02	J-395/CVI	292.8	12	130	336	344	338	345	323	354	1.0	1.0	1.0	1.0	0.9	1.0
P-711	J-543	J-546	14.0	30	130	0	1859	0	2005	1381	3742	0.0	0.8	0.0	0.9	0.6	1.7
P-712	J-546	J-547	295.3	30	130	4	1852	4	1998	1377	3733	0.0	0.8	0.0	0.9	0.6	1.7
P-714	J-547	J-548	942.1	16	150	695	1422	700	1480	1233	2195	1.1	2.3	1.1	2.4	2.0	3.5
P-715	J-545	J-549	29.7	18	130	0	1859	0	2005	1381	3742	0.0	2.3	0.0	2.5	1.7	4.7
P-717	J-538	J328	80.8	24	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-720	J-549	J-551	10.0	18	130	0	1859	0	2005	1381	3742	0.0	2.3	0.0	2.5	1.7	4.7
P-721	J-551	J-543	10.0	30	130	0	1859	0	2005	1381	3742	0.0	0.8	0.0	0.9	0.6	1.7
P-722	J-550	J-552	10.0	24	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-726	J330	J-545	71.3	12	130	0	1859	0	2005	1381	3742	0.0	5.3	0.0	5.7	3.9	10.6
P-727	J-553	J-554	1.0	12	130	0	413	0	558	0	2287	0.0	1.2	0.0	1.6	0.0	6.5
P-729	J-544	J-554	39.1	12	130	0	1859	0	2005	1381	3742	0.0	5.3	0.0	5.7	3.9	10.6
P73	J-WATER01	J52	138.4	8	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-731	J-555	J-556	1.0	4	130	0	1446	0	1446	1381	1454	0.0	36.9	0.0	36.9	35.3	37.1
P-736	J-551	J-559	10.0	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-738	J-549	J-560	10.0	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-741	J-561	J-552	2.0	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-743	J-562	J-550	2.0	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-746	J-559	PMP-10	40.4	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-747	PMP-10	J-561	45.1	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-748	J-560	PMP-11	39.4	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-749	PMP-11	J-562	47.4	18	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P75	J-WATER02	J54	139.0	8	120	265	296	267	298	263	318	1.7	1.9	1.7	1.9	1.7	2.0
P-750	PRV-1	J-556	26.0	12	130	0	413	0	558	0	2287	0.0	1.2	0.0	1.6	0.0	6.5
P-751	J-553	PRV-1	25.9	12	130	0	413	0	558	0	2287	0.0	1.2	0.0	1.6	0.0	6.5
P-752	J-554	PRV-2	26.7	4	130	0	1446	0	1447	1381	1454	0.0	36.9	0.0	36.9	35.3	37.1
P-753	PRV-2	J-555	25.2	4	130	0	1446	0	1446	1381	1454	0.0	36.9	0.0	36.9	35.3	37.1
P-755	R-WELL9	PMP-WELL9	47.4	6	130	1711	1673	1722	1674	1660	1685	19.4	19.0	19.5	19.0	18.8	19.1
P-760	J-547	PRV-4	120.0	16	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-761	PRV-4	J-BUCK/WELL0902	104.6	16	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-763	PRV-5	J-VECTOR/WELL08	41.8	16	130	1280	1284	1280	1285	1283	1296	2.0	2.0	2.0	2.1	2.0	2.1
P-766	J-BUCK07	J-566	1334.1	30	110	365	1431	365	1557	961	3023	0.2	0.7	0.2	0.7	0.4	1.4
P-767	J-566	J-BUCK/ORB03	849.5	30	110	365	1431	365	1557	961	3023	0.2	0.7	0.2	0.7	0.4	1.4
P-769	J-547	J-567	24.7	6	130	1005	2089	1011	2176	1796	3206	11.4	23.7	11.5	24.7	20.4	36.4
P77	J54	J56	111.1	4	130	4	7	4	7	4	9	0.1	0.2	0.1	0.2	0.1	0.2

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
P-770	J-567	J-568	941.1	30	150	1005	2089	1011	2176	1796	3206	0.5	0.9	0.5	1.0	0.8	1.5
P-771	J-BUCK08	J-BUCK/ORB02	1846.5	30	110	1074	987	1073	1133	348	2944	0.5	0.4	0.5	0.5	0.2	1.3
P-773	PRV-6	J-SP20	76.4	6	110	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-775	PMP-WELL8	PRV-5	20.1	16	130	1280	1284	1280	1285	1283	1296	2.0	2.0	2.0	2.1	2.0	2.1
P-776	PMP-WELL7	PRV-6	45.7	6	110	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-778	J-547	J-571	90.0	6	130	1707	1666	1719	1666	1656	1676	19.4	18.9	19.5	18.9	18.8	19.0
P-780	J-538	J10	166.4	24	130	0	1859	0	2005	1381	3742	0.0	1.3	0.0	1.4	1.0	2.7
P79	J-BNTLYHER01	J58	399.2	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
P81	J60	J-BNTLYHER01	135.3	12	130	18	35	18	36	22	43	0.1	0.1	0.1	0.1	0.1	0.1
P83	J60	J62	386.7	12	130	1969	1967	1981	1972	1943	2033	5.6	5.6	5.6	5.6	5.5	5.8
P85	J-39517	J64	372.5	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
P87	J-HEARTH06	J66	121.5	8	130	30	24	30	24	27	22	0.2	0.2	0.2	0.2	0.2	0.1
P89	J68	J-HEARTH06	80.6	8	130	34	28	34	27	31	25	0.2	0.2	0.2	0.2	0.2	0.2
P91	J70	J68	143.8	8	130	31	21	31	20	27	17	0.2	0.1	0.2	0.1	0.2	0.1
P93	J-HEARTH09	J72	138.3	8	130	24	7	24	6	18	1	0.2	0.0	0.2	0.0	0.1	0.0
P95	J66	J82	60.4	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P97	J68	J80	97.3	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P99	J70	J78	91.7	6	130	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
PINEWD01	J-PNWD03	J-PNWD02	298.0	8	120	85	82	85	82	81	86	0.5	0.5	0.5	0.5	0.5	0.5
PINEWD02	J-PNWD02	J-PNWD01	41.4	8	120	302	274	305	274	287	280	1.9	1.7	1.9	1.7	1.8	1.8
PINEWD03	J12	J-TAM/PNWD	244.9	8	120	359	338	362	338	344	350	2.3	2.2	2.3	2.2	2.2	2.2
PINEWD04	J-TAM/PNWD	J-IRNWD/PN02	424.8	6	120	208	183	211	183	197	185	2.4	2.1	2.4	2.1	2.2	2.1
PINION01	J-CONIF/PINION01	J-PINION	259.7	8	130	15	16	15	16	17	16	0.1	0.1	0.1	0.1	0.1	0.1
PINION02	J-PINION	J-CONIF/PINION02	150.3	8	130	19	23	19	23	22	25	0.1	0.1	0.1	0.1	0.1	0.2
P-IRNWD18	J-IRNWD/PN01	J-IRNWD/PN02	18.0	6	120	215	197	218	197	205	202	2.4	2.2	2.5	2.2	2.3	2.3
PMP-10_AL	PMP-10_NU	PMP-10	1.0	99	150	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
PMP-11_AL	PMP-11_NU	PMP-11	1.0	99	150	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
P-SCIPARK4	J-SP27	J-SP28	202.3	10	110	5	9	5	10	6	12	0.0	0.0	0.0	0.0	0.0	0.0
P-SCIPARK4	J-SP29	J-SP27	378.9	8	110	2	4	2	5	3	6	0.0	0.0	0.0	0.0	0.0	0.0
P-TANK	T-1	J-AMBRTANK02	5.0	36	110	1074	987	1073	1133	348	2944	0.3	0.3	0.3	0.4	0.1	0.9
P-WELL201	R-WELL2	PMP-WELL2	61.2	16	110	2307	2310	2327	2318	2265	2422	3.7	3.7	3.7	3.7	3.6	3.9
P-WELL202	PMP-WELL2	J-WELL02	67.3	16	110	2307	2310	2327	2318	2265	2422	3.7	3.7	3.7	3.7	3.6	3.9
P-WELL203	J-WELL02	J-S.ALLEY/WELL02	65.9	16	130	663	680	671	685	680	754	1.1	1.1	1.1	1.1	1.1	1.2
P-WELL204	J-WELL02	J-CR/WELL02	73.3	16	130	1641	1624	1653	1626	1580	1660	2.6	2.6	2.6	2.6	2.5	2.6
P-WELL301	R-WELL3	PMP-WELL3	41.0	10	120	2081	2083	2092	2088	2058	2142	8.5	8.5	8.5	8.5	8.4	8.8
P-WELL302	PMP-WELL3	J-CR/WELL03	64.3	10	110	2081	2083	2092	2088	2058	2142	8.5	8.5	8.5	8.5	8.4	8.8
P-WELL401	R-3	PMP-WELL4	32.0	12	120	1698	1718	1718	1726	1661	1827	4.8	4.9	4.9	4.9	4.7	5.2
P-WELL402	PMP-WELL4	J-TAM/WELL04	133.8	12	120	1698	1718	1718	1726	1661	1827	4.8	4.9	4.9	4.9	4.7	5.2
P-WELL502	PMP-WELL5	J-BOUG/WELL05-02	39.9	12	130	2072	2060	2087	2065	2031	2136	5.9	5.8	5.9	5.9	5.8	6.1
P-WELL503	J-BOUG/WELL05-02	J-BOUG/WELL05-01	90.2	12	130	768	944	775	956	870	1065	2.2	2.7	2.2	2.7	2.5	3.0
P-WELL701	R-WELL7	PMP-WELL7	26.3	6	110	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
ROSSO	J-ROSSO	J-GAL/ROSSO	143.2	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK01	J-BUCK/VECTOR	J-VECTOR/WELL08	318.1	16	130	1277	1277	1280	1285	1283	1296	2.0	2.0	2.0	2.1	2.0	2.1
SCIPARK02	J-BUCK/BENT	J288	401.5	12	130	77	154	78	157	95	189	0.2	0.4	0.2	0.4	0.3	0.5
SCIPARK03	J-BENTPKWY01	J290	540.1	12	130	63	126	64	128	77	155	0.2	0.4	0.2	0.4	0.2	0.4
SCIPARK04	J-BENTPKWY/VECT	J-BENTPKWY02	377.1	12	130	56	112	57	114	69	137	0.2	0.3	0.2	0.3	0.2	0.4
SCIPARK05	J-BENTPKWY02	J310	462.2	12	130	17	33	17	34	21	41	0.0	0.1	0.0	0.1	0.1	0.1
SCIPARK07	J-BENT02	J-ORCH01	96.5	12	130	1	2	1	2	1	2	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK08	J-BENT01	J-BENT02	473.8	12	130	21	42	22	43	26	52	0.1	0.1	0.1	0.1	0.1	0.1

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow						Velocity					
						EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
SCIPARK09	J-BENTPKWY02	J-BENT01	136.1	12	130	36	71	36	73	44	88	0.1	0.2	0.1	0.2	0.1	0.2
SCIPARK10	J304	J-BENT02	181.0	12	130	17	34	17	34	21	41	0.0	0.1	0.0	0.1	0.1	0.1
SCIPARK11	J-BENT03	J302	190.3	12	130	6	13	6	13	8	16	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK12	J-BENT03	J300	455.0	8	130	1	1	1	1	1	2	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK13	J-ORCH02	J-BENT03	244.1	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK14	J-BUCK/ORB01	J-SP01	380.0	12	130	98	196	100	199	120	240	0.3	0.6	0.3	0.6	0.3	0.7
SCIPARK15	J-SP01	J-SP02	93.8	12	130	84	168	86	171	103	206	0.2	0.5	0.2	0.5	0.3	0.6
SCIPARK16	J-SP02	J-SP03	15.0	8	130	11	21	11	21	13	26	0.1	0.1	0.1	0.1	0.1	0.2
SCIPARK17	J-SP02	J-SP05	66.7	8	130	49	98	50	100	60	120	0.3	0.6	0.3	0.6	0.4	0.8
SCIPARK18	J-SP03	J-SP04	234.7	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK19	J-SP01	J-SP23	778.1	6	130	11	21	11	21	13	26	0.1	0.2	0.1	0.2	0.1	0.3
SCIPARK20	J-SP23	J-SP24	116.9	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK21	J-SP23	J-SP25	387.8	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK22	J-SP02	J-SP17	120.6	10	130	21	42	21	43	26	52	0.1	0.2	0.1	0.2	0.1	0.2
SCIPARK23	J-SP17	J-SP18	48.5	10	130	18	35	18	36	22	43	0.1	0.1	0.1	0.1	0.1	0.2
SCIPARK24	J-SP18	J-SP19	188.2	10	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK25	J-SP18	J-SP20	129.8	10	130	11	21	11	21	13	26	0.0	0.1	0.0	0.1	0.1	0.1
SCIPARK26	J-SP20	J292	439.3	10	130	7	14	7	14	9	17	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK27	J-SP03	J-SP21	616.9	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
SCIPARK28	J-SP06	J-SP08	110.5	10	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK29	J-SP08	J-SP13	858.8	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK30	J-SP05	J-SP26	970.7	10	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK31	J-SP05	J-SP07	113.0	10	130	42	84	43	85	52	103	0.2	0.3	0.2	0.3	0.2	0.4
SCIPARK32	J-SP07	J-SP09	150.8	10	130	28	56	29	57	34	69	0.1	0.2	0.1	0.2	0.1	0.3
SCIPARK33	J-SP09	J-SP10	75.1	10	130	25	49	25	50	30	60	0.1	0.2	0.1	0.2	0.1	0.2
SCIPARK34	J-SP10	J-SP11	152.7	10	130	8	17	8	17	10	20	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK35	J-SP11	J-SP12	138.6	6	130	5	10	5	10	6	12	0.1	0.1	0.1	0.1	0.1	0.1
SCIPARK36	J-SP12	J-SP14	291.7	6	130	1	3	1	3	2	3	0.0	0.0	0.0	0.0	0.0	0.0
SCIPARK37	J-SP14	J-SP15	98.4	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK38	J-SP10	J-SP16	306.5	10	130	13	25	13	26	16	31	0.1	0.1	0.1	0.1	0.1	0.1
SCIPARK39	J-SP16	J294	138.4	10	130	9	18	9	19	11	23	0.0	0.1	0.0	0.1	0.0	0.1
SCIPARK40	J-BUCK/MDVLY	J-SP27	1347.0	10	110	11	21	11	21	13	26	0.0	0.1	0.0	0.1	0.1	0.1
SCIPARK43	J-SP28	J-SP29	309.9	8	110	1	3	1	3	2	3	0.0	0.0	0.0	0.0	0.0	0.0
SENNA	J-AZURE/SEN	J-SIENNA	160.5	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
SHMRKCR	J-TAM/WSTWD	J90	325.6	6	130	7	14	7	14	9	17	0.1	0.2	0.1	0.2	0.1	0.2
SKIPARK06	J306	J-BENTPKWY/ORCH	427.9	8	130	6	12	6	13	8	15	0.0	0.1	0.0	0.1	0.0	0.1
LVRBRCH0	J-BRCH/W-END	J-DES/BRCH	151.6	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
LVRBRCH0	J-DES/BRCH	J-WLDRS/BRCH	252.0	6	120	0	1	0	1	1	1	0.0	0.0	0.0	0.0	0.0	0.0
SNAFBIT01	J-SNAFFLE/LASSO	J-SNAFFLE/S-END	167.1	12	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
SNAFBIT02	J-HEY/SNAFFLE01	J-SNAFFLE/LASSO	238.3	12	130	18	36	19	37	22	45	0.1	0.1	0.1	0.1	0.1	0.1
SNAFBIT03	J-HEY/SNAFFLE01	J-SNAFFLE/N-END	245.3	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
SNFRD01	J-SANF/MNTRRA	J-SANF/MNTCTO	293.6	10	130	191	220	201	241	273	358	0.8	0.9	0.8	1.0	1.1	1.5
SNFRD02	J-SANF/MNTCTO	J-SANF/LASBRI	264.6	10	130	301	356	310	377	385	488	1.2	1.5	1.3	1.5	1.6	2.0
SNFRD03	J-SANF/LASBRI	J-SANF/CHANTEL	280.5	10	130	319	387	327	405	396	509	1.3	1.6	1.3	1.7	1.6	2.1
SNFRD04	J-SANF/CHANTEL	J-SANF/BALER	217.9	10	130	343	433	347	447	412	531	1.4	1.8	1.4	1.8	1.7	2.2
SNFRD05	J-SANF/BALER	J-SANF/GAL	121.8	10	130	367	482	372	497	442	591	1.5	2.0	1.5	2.0	1.8	2.4
SNFRD06	J-SANF/GAL	J274	164.5	10	130	497	661	503	681	597	806	2.0	2.7	2.1	2.8	2.4	3.3
SPRUCE01	J-SPRCE/LOOP01	J-DES/S-END	199.5	8	130	7	13	7	13	8	16	0.0	0.1	0.0	0.1	0.1	0.1
SPRUCE02	J-DES/S-END	J-SPRCE	46.3	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1

ID	From Node	To Node	Length	Diameter	Roughness	Flow						Velocity					
			(ft)	(in)		EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
SPRUCE03	J-SPRCE/LOOP01	J-SPRCE/LOOP02	887.7	8	130	7	13	7	13	8	16	0.0	0.1	0.0	0.1	0.1	0.1
SYCAMORE	J-BOUG/SYC	J-SYC/CONIF	261.1	8	130	30	23	30	23	34	21	0.2	0.1	0.2	0.1	0.2	0.1
TAMARK01	J-TAM/PNWD	J-TAM/OAKWD	320.5	8	120	802	741	811	744	767	766	5.1	4.7	5.2	4.7	4.9	4.9
TAMARK02	J-TAM/OAKWD	J-TAM/WELL04	212.3	10	120	1031	1004	1043	1008	999	1056	4.2	4.1	4.3	4.1	4.1	4.3
TAMARK03	J-TAM/WELL04	J-TAM/IRNWD	180.4	10	120	663	707	671	711	657	763	2.7	2.9	2.7	2.9	2.7	3.1
TAMARK04	J-TAM/IRNWD	J-TAM/FIR	289.2	6	120	143	170	144	172	146	189	1.6	1.9	1.6	1.9	1.7	2.2
TAMARK05	J-TAM/FIR	J-TAM/WSTWD	272.8	6	120	132	149	134	150	133	164	1.5	1.7	1.5	1.7	1.5	1.9
TAMARK06	J-TAM/WSTWD	J-TAM/HEATH	267.1	6	120	57	66	58	67	58	73	0.7	0.8	0.7	0.8	0.7	0.8
TAMARK07	J-TAM/HEATH	J-TAM/MAHOCIR	269.5	6	120	50	52	51	53	50	56	0.6	0.6	0.6	0.6	0.6	0.6
TAMARK08	J-TAM/MAHOCIR	J-MAHO/TAM	301.2	6	120	27	24	28	24	26	24	0.3	0.3	0.3	0.3	0.3	0.3
TULIP	J-TULIP	J-CANT/TULIP	102.6	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
TUSCAN	J-AZURE/TUSC	J-TSCN	159.9	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
VERBENA	J-WIST/VERB	J-LANT/VERB	285.2	8	130	78	128	78	130	99	149	0.5	0.8	0.5	0.8	0.6	1.0
WATER01	J-395/8TH02	J-WATER01	155.3	8	120	340	351	341	352	327	362	2.2	2.2	2.2	2.2	2.1	2.3
WATER02	J-WATER01	J-WATER02	78.4	8	120	343	358	345	359	332	371	2.2	2.3	2.2	2.3	2.1	2.4
WATER03	J54	J-WATER03	172.4	8	120	272	310	274	313	271	335	1.7	2.0	1.7	2.0	1.7	2.1
WATER04	J-WATER03	J-BUCK/WTR01	314.3	8	120	235	223	236	223	214	224	1.5	1.4	1.5	1.4	1.4	1.4
WATER05	J-WATER04	J-WATER03	152.9	8	120	41	93	42	97	61	119	0.3	0.6	0.3	0.6	0.4	0.8
WATER06	J-WATER05	J-WATER04	288.3	8	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.1
WATER07	J-WATER04	J-BUCK/WTR02	383.7	8	120	48	107	49	111	70	136	0.3	0.7	0.3	0.7	0.4	0.9
ESTCOMM	J-WSTCOMM05	J-WSTCOMM03	355.2	10	130	301	221	315	230	290	212	1.2	0.9	1.3	0.9	1.2	0.9
ESTCOMM	J-WSTCOMM03	J-WSTCOMM02	328.7	10	130	543	459	553	462	514	461	2.2	1.9	2.3	1.9	2.1	1.9
ESTCOMM	J-WSTCOMM02	J-WSTCOMM01	390.9	10	130	644	572	653	574	612	583	2.6	2.3	2.7	2.3	2.5	2.4
ESTCOMM	J-WSTCOMM01	J-TAM/PNWD	311.8	10	130	648	579	656	581	616	592	2.6	2.4	2.7	2.4	2.5	2.4
ESTCOMM	J-WSTCOMM09	J-WSTCOMM08	170.5	8	120	117	97	118	96	108	96	0.7	0.6	0.8	0.6	0.7	0.6
ESTCOMM	J-WSTCOMM08	J-PNWD03	126.9	8	120	128	118	128	118	121	121	0.8	0.8	0.8	0.8	0.8	0.8
ESTCOMM	J110	J108	292.4	8	130	58	57	58	56	55	59	0.4	0.4	0.4	0.4	0.3	0.4
ESTCOMM	J-WSTCOMM06	J-PNWD02	124.2	8	130	213	185	216	185	201	186	1.4	1.2	1.4	1.2	1.3	1.2
ESTCOMM	J106	J-WSTCOMM04	325.1	8	130	145	107	148	107	134	101	0.9	0.7	0.9	0.7	0.9	0.6
ESTCOMM	J-WSTCOMM04	J-WSTCOMM05	247.1	8	130	235	199	237	198	219	197	1.5	1.3	1.5	1.3	1.4	1.3
ESTCOMM	J104	J-WSTCOMM04	264.2	8	130	94	99	93	97	89	105	0.6	0.6	0.6	0.6	0.6	0.7
ESTCOMM	J-PNWD03	J-PNWD01	557.2	6	120	46	43	47	43	44	44	0.5	0.5	0.5	0.5	0.5	0.5
WHTOAK01	J-WHTOAK	J-WHTOAK/WHTPINE	424.5	8	130	13	17	13	17	16	18	0.1	0.1	0.1	0.1	0.1	0.1
WHTOAK02	J-WHTOAK/WHTPINE	J-CDR/WHTOAK	342.0	8	130	21	27	21	27	25	30	0.1	0.2	0.1	0.2	0.2	0.2
WHTOAK03	J-CDR/ASHWD	J240	365.7	8	130	20	31	21	31	24	36	0.1	0.2	0.1	0.2	0.2	0.2
WHTPINE	J-CDR/WHTPINE	J-WHTOAK/WHTPINE	195.6	8	130	11	17	12	17	14	20	0.1	0.1	0.1	0.1	0.1	0.1
WIST01	J242	J-WIST/LILAC	430.0	8	130	17	39	18	42	27	55	0.1	0.2	0.1	0.3	0.2	0.3
WIST02	J-WIST/LILAC	J-WIST/HONEY	495.9	8	130	10	53	10	56	36	72	0.1	0.3	0.1	0.4	0.2	0.5
WIST03	J-WIST/HONEY	J244	446.9	8	130	61	94	61	96	80	108	0.4	0.6	0.4	0.6	0.5	0.7
WIST04	J-WIST/CAM	J-WIST/MRNGLRY	261.1	8	130	71	115	72	118	93	134	0.5	0.7	0.5	0.8	0.6	0.9
WIST05	J-WIST/MRNGLRY	J-WIST/AZALEA	269.6	8	130	34	7	34	5	12	1	0.2	0.0	0.2	0.0	0.1	0.0
WIST06	J-WIST/AZALEA	J-WIST/VERB	232.8	8	130	41	21	41	20	21	17	0.3	0.1	0.3	0.1	0.1	0.1
WIST07	J-WIST/VERB	J-WIST/ASTER	285.2	8	130	33	100	33	103	74	124	0.2	0.6	0.2	0.7	0.5	0.8
WIST08	J-WIST/ASTER	J246	472.6	8	130	26	86	26	89	65	107	0.2	0.5	0.2	0.6	0.4	0.7
WLDRS01	J-WLDRS/W-END	J-WLDRS/7TH	108.6	6	120	28	29	28	29	24	23	0.3	0.3	0.3	0.3	0.3	0.3
WLDRS02	J166	J258	169.3	6	120	33	19	32	16	3	18	0.4	0.2	0.4	0.2	0.0	0.2
WLDRS03	J-WLDRS/2ND	J-WLDRS/BRCH	718.2	6	120	7	15	8	15	9	18	0.1	0.2	0.1	0.2	0.1	0.2
WLDRS04	J-WLDRS/BRCH	J-WLDRS/E-END	177.0	6	120	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
/STCOMM	J-HWY8806	J-DHS04	504.9	10	130	106	70	98	61	81	55	0.4	0.3	0.4	0.3	0.3	0.2

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow						Velocity					
						EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD	EX_MDD*	EX_PHD	5YR_MDD*	5YR_PHD	V_MDD	V_PHD
/STCOMM(	J-DHS04	J24	563.9	10	130	80	51	93	61	88	49	0.3	0.2	0.4	0.2	0.4	0.2
/STCOMM(	J-WSTCOMM07	J-WSTCOMM05	506.3	10	130	70	30	82	40	75	23	0.3	0.1	0.3	0.2	0.3	0.1
WSTWD01	J98	J96	374.9	6	130	124	109	126	109	117	110	1.4	1.2	1.4	1.2	1.3	1.3
WSTWD02	J-WSTWD/MPL	J-WSTWD01	281.5	6	130	74	70	75	70	71	72	0.8	0.8	0.9	0.8	0.8	0.8
WSTWD03	J-WSTWD01	J-WSTWD/OAKWD	233.8	6	120	78	77	79	77	76	81	0.9	0.9	0.9	0.9	0.9	0.9
WSTWD04	J-WSTWD/OAKWD	J-WSTWD/CDR	546.7	6	120	85	72	86	72	80	72	1.0	0.8	1.0	0.8	0.9	0.8
WSTWD05	J-WSTWD/CDR	J88	289.9	6	120	52	46	52	46	48	47	0.6	0.5	0.6	0.5	0.6	0.5
WSTWD06	J86	J-TAM/WSTWD	433.7	6	120	64	62	65	62	62	65	0.7	0.7	0.7	0.7	0.7	0.7
ZALD01	J-ZALD/OULA	J-ZALD/LUCE	547.3	6	120	11	21	10	22	3	29	0.1	0.2	0.1	0.3	0.0	0.3
ZALD02	J-ZALD/LUCE	J-ZALD01	131.0	8	120	21	5	20	6	10	10	0.1	0.0	0.1	0.0	0.1	0.1
ZALD03	J140	J-ZALD/10TH	317.0	6	130	14	19	13	21	2	27	0.2	0.2	0.1	0.2	0.0	0.3
ZALD04	J-ZALD/10TH	J-ZALD/E-END	114.5	6	130	4	7	4	7	4	9	0.0	0.1	0.0	0.1	0.0	0.1
ZEROLENE0	J254	J-ZERO01	457.3	12	130	68	135	82	164	335	453	0.2	0.4	0.2	0.5	1.0	1.3
ZEROLENE0	J-ZERO01	J-ZERO02	573.5	12	130	60	120	79	157	331	445	0.2	0.3	0.2	0.4	0.9	1.3
ZEROLENE0	J-ZERO01	J-ZERO03	98.7	10	130	4	7	4	7	4	9	0.0	0.0	0.0	0.0	0.0	0.0
ZEROLENE0	J280	J282	419.9	12	130	56	112	57	114	69	137	0.2	0.3	0.2	0.3	0.2	0.4

*Existing and 5-YR MDD models produced errors when PRV valves in Buckeye Booster Station were open. Results reflect these valves being closed. Vested reflects PRV valves being open.