BEAR RIVER WATER CONSERVANCY DISTRICT

SOUTH WILLARD WATER SYSTEM IMPACT FEE FACILITIES PLAN

FEBRUARY 2013

HANSEN ALLEN & LUCE inc
ENGINEERS

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Project Engineer

Prepared by:

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February 2013

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CERTIFICATION OF IMPACT FEE FACILITY PLAN

I certify that, to the best of my knowledge, the attached impact fee facilities plan:

1. includes only the costs of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six to ten years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities;
    b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and
3. complies in each and every relevant respect with the Impact Fees Act.

Prepared by: 
William S. Bigelow, P.E.

IMPACT FEES FACILITIES PLAN

INTRODUCTION

In October 2005, the Bear River Water Conservancy District (District) prepared a Drinking Water Master Plan for District owned water facilities for all of Box Elder County. This Master Plan included an overall master plan for a future public drinking water system in the South Willard area.

Since 2005, much planning has been done for the District's water system in the South Willard area. In 2006, a well drilling project was successfully completed. In 2008, the District obtained funding from the Utah Drinking Water Board to construct the initial portion of the first phase water system. As of the date of this report, the system is serving three wholesale water connections to existing public drinking water systems and no residential or commercial connections. The three wholesale water connections are with two existing trailer parks and the South Willard Water Company.

This Impact Fee Facilities Plan (IFFP) covers Phase 1 of the District's South Willard drinking water system. The IFFP includes facilities that have been completed and future projects that will be constructed by the District to meet water demands required by future growth.

NUMBER OF UNITS SERVED

Phase I of the District's South Willard Drinking Water System has been planned to serve Pressure Zone 1 East and Pressure Zone 2. These service area boundaries are shown in Figure 1, and are described as follows: The service area is bordered by the existing South Willard Water Company (SWWC) boundary on the north (ranges from about 8100 to 8300 South Highway 89 as shown), the Weber County line on the south, Interstate 15 on the west, and the elevation contour 4480 on the east.

Box Elder County currently has zoned this area in two types of land-use zones: R-1-20 and C-H. The R-1-20 zoning is Residential - 20,000 square feet units (approximately ½ acre). There are 340 acres of the R-1-20 zoning in the Phase I service area. The C-H zoning is Commercial - Highway. This area is located on both sides of Highway 89 in the southern end of the Phase I service area. There are 165 acres of land zoned under the C-H designation in the Phase I service area.

Figure 1 shows that there are additional lands adjacent to the Phase I service area that could potentially request water service from the District in the future. If this occurs, the IFFP should be modified as necessary to include these areas.

Existing Development

As of the date of this report, the system is serving three wholesale water connections to existing public drinking water systems and no residential or commercial connections. The three wholesale water connections are two existing trailer parks and the South Willard Water Company. It is estimated that the equivalent demand on the water system from these connections is 59 Equivalent Residential Connections ERCs.

Growth Projections

A summary of projected growth for the Phase 1 service area is shown in Table 1. The number of connections for Phase I build out conditions is based on the assumption that residential development density will average 2.18 units per acre and commercial development density will average 1 unit per acre, with an added 10% reduction of developable units for open space, public use, undevelopable land, etc. Calculations supporting the values in Table 1 are included in the Appendix.

TABLE 1
PHASE 1 WATER CONNECTIONS PROJECTION

Development	Service Area Build out ERCs
Residential Development	670
Commercial Development	150
TOTAL	**820**

WATER DEMAND

The growth projections were used as a basis to calculate the projected future water demand for the District's Phase I Service Area. Table 2 shows the future demand that is planned to be met by District sources based on the Utah Division of Drinking Water (DDW) R309-510 sizing criteria. The facilities planned for this system are for indoor water usage only. Several secondary systems to supply outdoor water needs exist in the South Willard area. These existing systems will provide secondary water to future development. Detailed calculations supporting the values in Table 2 are included in the Appendix.

TABLE 2
ESTIMATED WATER SYSTEM DEMANDS

	ERCs	Peak Day (GPM)	AF/Year
Future Residential	670	372	300
Future Commercial	150	83	67
Existing Wholesale	59	33	26
TOTAL	**879**	**488**	**394**

WATER SOURCES

In 2002, the District filed a new appropriation for seven (7) well sites, or points of diversion, in the area east of South Willard. This filing was intended to satisfy the future growth needs of the South Willard area. The State Engineer granted the District 5.0 cubic feet per second (about 2,200 gallons per minute) and 1,647 acre feet of annual withdrawal. In 2006, the first well (Well #4) was drilled. Phase I will utilize this well as its initial source of drinking water. The estimated safe yield from the new well is 500 gpm, which is slightly more than needed for peak day demand at build out condition as shown in Table 2. However, DDW rules state that a public drinking water source must have two sources of drinking water once there are over 100 connections to a system. A second well (Well #3) is planned to be drilled in the area to satisfy this requirement when the water system serves more than 100 connections.

The estimated safe yield from the Well #4 is 500 gpm. Using a safety factor of 1.5 for peak day supply and DDW rules for indoor water use, 595 residential connections can be serviced with this source capacity. If it is assumed that Well #3 will have the same yield, then the total number of connections that can be served with the District's two wells is 1,190 connections.

WATER STORAGE

The total required storage capacity for the water system consists of equalization storage for the indoor and outdoor use on the system during peak day, fire flow storage, and emergency storage. Equalization storage is calculated based on the requirements included in Table 2 or 400 gallons per day per ERC per DDW standards. Fire storage was calculated based on a fire flow of 2,000 gpm and duration of 2 hours for a total of 240,000 gallons. Emergency storage is typically about 10% of the total required storage. The calculated storage requirements for the three flow conditions described above are summarized in Table 3. The District's initial storage reservoir was been sized at 1.0 million gallons to take advantage of economy of scale and favorable bidding climate. It appears that the District's existing 1.0 MG tank is sufficient to serve the first phase area's water storage needs.

The District's storage reservoir has been sized at 1.0 million gallons. Using DDW standards, this reservoir has the capacity to serve 1,650 connections assuming 2,000 gallons per minute fire flow for 2 hours and a 10% operational reserve. Calculations supporting these values are included in Appendix A.

DISTRIBUTION SYSTEM

The Phase 1 South Willard Culinary system is designed to supply the following minimum pressures under the corresponding flow conditions as required by DDW:

Peak Day Plus Fire Flow..... 20 psi minimum
Peak Instantaneous Flow..... 30 psi minimum
Peak Day Flow..... 40 psi minimum

The distribution system has been sized according to DDW rules to provide adequate service pressures for 1,640 units plus the wholesale water delivery commitment for all operating conditions as shown above. A computer model of the build out distribution system was prepared to size pipelines with the capacity to meet the criteria shown. Printouts from the computer model are included in Appendix B.

TABLE 3
PHASE I STORAGE REQUIREMENTS AT BUILD OUT

RESERVOIR SERVICE AREA	NUMBER OF CONNECTIONS ERCs	STORAGE REQUIRED (GALLONS)
Residential	670	268,000
Commercial	150	60,000
Wholesale	59	24,000
Fire Storage (2,000 gpm for 2 Hours)		240,000
Emergency Storage (10%)		59,000
TOTAL	**879**	**651,000**

The piping system for Phase I consists of a 16-inch-diameter transmission pipeline from the storage reservoir to the eastern boundary of Pressure Zone 2. At this point the trunk pipeline reduces to a 12-inch-diameter pipeline proceeding east to Highway 89 and a 12-inch-diameter pipeline proceeding south. Figure 2 shows the location of these pipelines within the Phase 1 water service area.

EXCESS SYSTEM CAPACITY

The sections discussing the capacity of the sources, storage and distribution facilities make it clear that there is significant additional capacity in the water system beyond the number of units that are currently shown in the Phase 1 service area. Two variables need to be considered in this regard. First, there are additional lands adjacent to the Phase I service area that could potentially request water service from the District in the future. Second, the zoning densities could easily change from the current zoning to allow more units per acre. The District has chosen to build a water system for the Phase I service area that has extra capacity enough to accommodate changes in these two variables.

ALREADY INCURRED COSTS

Table 4 includes a summary of the costs already incurred to construct the Phase 1 system.

Funding Sources

In 2007 the District applied for and received funding in the amount of $1,818,000 in loan funds and $ 600,000 in grant funds from the Utah Drinking Water Board to fund construction of a new water system for the District's service area. The District pledged up to $480,000 as the District's share of the project funding.

TABLE 4
ALREADY INCURRED COSTS

ITEM	COST
Pipelines, Water Rights, Land Purchase & Well #4 Drilling	$1,141,412
Well #4 Pump Station	$ 626,967
1.0 MG Tank	$ 821,647
General	$ 345,363
TOTAL	**$ 2,935,389**

EXISTING SYSTEM DEFICIENCIES

There are no reported existing system deficiencies in the first phase water system that have been constructed by the District to date.

FUTURE PROJECTS

As mentioned earlier, when the number of connections in the South Willard water system reaches 100, the District will be required to develop another new source. This source will be Well #3. The costs for the projects associated with developing Well #3 are shown in Table 5.

TABLE 5
ESTIMATED PROJECT COSTS
(2021 Costs)

ITEM	COST
Well #3 Drilling	$ 704,129
Well #3 Pump Station & Pipeline	1,233,689
TOTAL	**$ 1,937,818**

REVENUE OPTIONS FOR FUTURE PROJECTS

Revenue options for the recommended projects, in addition to use fees, could include the following options: general obligation bonds, revenue bonds, State/Federal grants and loans, and impact fees. In reality, the District may need to consider a combination of these funding options. The following discussion describes each of these options.

General Obligation Bonds through Property Taxes

This form of debt enables the District to issue general obligation bonds for capital improvements and replacement. General Obligation (G.O.) Bonds would be used for items not typically financed through the Water Revenue Bonds (for example, the purchase of water source to ensure a sufficient water supply for the District in the future). G.O. bonds are debt instruments backed by the full faith and credit of the District which would be secured by an unconditional pledge of the District to levy assessments, charges or ad valorem taxes necessary to retire the bonds. G.O. bonds are the lowest-cost form of debt financing available to local governments and can be combined with other revenue sources such as specific fees, or special assessment charges to form a dual security through the District's revenue generating authority. These bonds are supported by the District as a whole, so the amount of debt issued for the water system is limited to a fixed percentage of the real market value for taxable property within the District. For growth related projects this type of revenue places an unfair burden on existing residents as they had previously paid for their level of service.

Revenue Bonds

This form of debt financing is also available to the District for utility related capital improvements. Unlike G.O. bonds, revenue bonds are not backed by the District as a whole, but constitute a lien against the water service charge revenues of a Water Utility. Revenue bonds present a greater risk to the investor than do G.O. bonds, since repayment of debt depends on an adequate revenue stream, legally defensible rate structure, and sound fiscal management by the issuing jurisdiction. Due to this increased risk, revenue bonds generally require a higher interest rate than G.O. bonds, although currently interest rates are at historic lows. This type of debt also has very specific coverage requirements in the form of a reserve fund specifying an amount, usually expressed in terms of average or maximum debt service due

in any future year. This debt service is required to be held as a cash reserve for annual debt service payment to the benefit of bondholders. Typically, voter approval is not required when issuing revenue bonds. For growth related projects this type of revenue places an unfair burden on existing residents as they had previously paid for their level of service.

State/Federal Grants and Loans

Historically, both local and county governments have experienced significant infrastructure funding support from state and federal government agencies in the form of block grants, direct grants in aid, interagency loans, and general revenue sharing. Federal expenditure pressures and virtual elimination of federal revenue sharing dollars are clear indicators that local government may be left to its own devices regarding infrastructure finance in general. However, state/federal grants and loans should be further investigated as a possible funding source for needed water system improvements.

It is also important to assess likely trends regarding federal/state assistance in infrastructure financing. Future trends indicate that grants will be replaced by loans through a public works revolving fund. Local governments can expect to access these revolving funds or public works trust funds by demonstrating both the need for and the ability to repay the borrowed monies, with interest. As with the revenue bonds discussed earlier, the ability of infrastructure programs to wisely manage their own finances will be a key element in evaluating whether many secondary funding sources, such as federal/state loans, will be available to the District.

Impact Fees

As discussed in section 1, an impact fee is a one-time charge to a new development for the purpose of raising funds for the construction of improvements required by the new growth and to maintain the current level of service. Impact fees in Utah are regulated by the Impact Fee Statute and substantial case law. Impact fees are a form of a development exaction that requires a fee to offset the burdens created by the development on existing municipal services. Funding the future improvements required by growth through impact fees does not place the burden on existing residents to provide funding of these new improvements.

User Fees

Similar to property taxes on existing residents, User Fees to pay for improvements related to new growth related projects places an unfair burden on existing residents as they had previously paid for their level of service.

REFERENCES

1. "Water System Master Plan Study", 2005, Hansen, Allen & Luce, Inc.

2. Division of Drinking Water Standards

Appendix A

Water Demand Calculations

CLIENT: BRWCD
PROJECT: South Willard Impact Fee Facility Plan
PROJECT NO.: 091.24.100
DATE: February 8, 2013

Service Type	Service Area Size *(Acres)*	Number of Connections *ERCs*
Residential	340	670
Commercial	165	150
Wholesale	N/A	59
TOTAL	505	879

2008 PER Buildout was calculated assuming the following:

2.18 Units per Acre for 1/2 Acre lots. Area zoning by Box Elder C
1.0 Units per Acre for 1 Acre lots
Commercial Area = 1 Acre Lots
90% land utilization assumed

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Bear River Water Conservancy District
South Willard Impact Fee Facility Plan Water Demand
February 8, 2013

Phase I Service Area Distribution System Capacity - 1699 ERCs

	POPULATION AND IRRIGATED ACREAGE DATA:	Residential	Commercial	Wholesale	Totals	UNITS
1	# Units in Service Area	1490	150	59	1,699	CONNECTIONS
2	# Acres of Outside Irrigation per Unit	0.00	0.00	0.00	0	ACRES/CONN.
3	Total # Acres of Outside Irrigation for the System	0.00	0.00	0.00	0	ACRES
	SOURCE REQUIREMENTS					
4	Annual Indoor Usage = 146,000 Gal/Year/Connection	668	67	26	761	ACRE FEET
5	Annual Outdoor Usage = 1.87 Acre Feet/Irrigated Acre	0	0	0	0	ACRE FEET
6	Total Annual Usage	668	67	26	761	ACRE FEET
7	Peak Day Indoor Demand = 800 Gal./Day/Connection	1,192,000	120,000	47,200	1,359,200	GAL/DAY
8	Peak Day Outdoor Demand = 3.96 Gpm/Irrigated Acre	0	0	0	0	GAL/DAY
9	Total Peak Day Demand	1,192,000	120,000	47,200	1,359,200	GAL/DAY
10	(Gallons per Minute)	828	83	33	944	GPM
	STORAGE REQUIREMENTS					
11	Indoor Requirement = 400 Gal/Connection	596,000	60,000	23,600	679,600	GALLONS
12	Outside Irrigation Requirement = 2,848 Gal/Irrigated Acre	0	0	0	0	GALLONS
13	Fire Storage (1000 gpm for 2 hours)	0	240,000	0	240,000	GALLONS
14	Emergency Operating Reserve, 10%	27,000	30,000	2,400	59,400	GALLONS
15	Total Storage (Rounded)	623,000	330,000	26,000	979,000	GALLONS
	DISTRIBUTION SYSTEM REQUIREMENTS					
16	Peak Hour Indoor Demand = 10.8(N^.64); N = # Connections	1,159	267	147	1,573	GPM
17	Peak Hour Outside Demand = 7.92 Gpm/Irrigated Acre	0	0	0	0	GPM
18	Total Peak Hour Demand	1,159	267	147	1,573	GPM

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Bear River Water Conservancy District
South Willard Impact Fee Facility Plan Water Demand
February 8, 2013

Phase I Service Area Buildout Water Demand - 879 ERCs

	POPULATION AND IRRIGATED ACREAGE DATA:	Residential	Commercial	Wholesale	Totals	UNITS
1	# Units in Service Area	670	150	59	879	CONNECTIONS
2	# Acres of Outside Irrigation per Unit	0.00	0.00	0.00	0	ACRES/CONN.
3	Total # Acres of Outside Irrigation for the System	0.00	0.00	0.00	0	ACRES
	SOURCE REQUIREMENTS					
4	Annual Indoor Usage = 146,000 Gal/Year/Connection	300	67	26	394	ACRE FEET
5	Annual Outdoor Usage = 1.87 Acre Feet/Irrigated Acre	0	0	0	0	ACRE FEET
6	Total Annual Usage	300	67	26	394	ACRE FEET
7	Peak Day Indoor Demand = 800 Gal./Day/Connection	536,000	120,000	47,200	703,200	GAL/DAY
8	Peak Day Outdoor Demand = 3.96 Gpm/Irrigated Acre	0	0	0	0	GAL/DAY
9	Total Peak Day Demand	536,000	120,000	47,200	703,200	GAL/DAY
10	(Gallons per Minute)	372	83	33	488	GPM
	STORAGE REQUIREMENTS					
11	Indoor Requirement = 400 Gal/Connection	268,000	60,000	23,600	351,600	GALLONS
12	Outside Irrigation Requirement = 2,848 Gal/Irrigated Acre	0	0	0	0	GALLONS
13	Fire Storage (1000 gpm for 2 hours)	0	240,000	0	240,000	GALLONS
14	Emergency Operating Reserve, 10%	27,000	30,000	2,400	59,400	GALLONS
15	Total Storage (Rounded)	295,000	330,000	26,000	651,000	GALLONS
	DISTRIBUTION SYSTEM REQUIREMENTS					
16	Peak Hour Indoor Demand = 10.8(N^.64); N = # Connections	695	267	147	1,109	GPM
17	Peak Hour Outside Demand = 7.92 Gpm/Irrigated Acre	0	0	0	0	GPM
18	Total Peak Hour Demand	695	267	147	1,109	GPM

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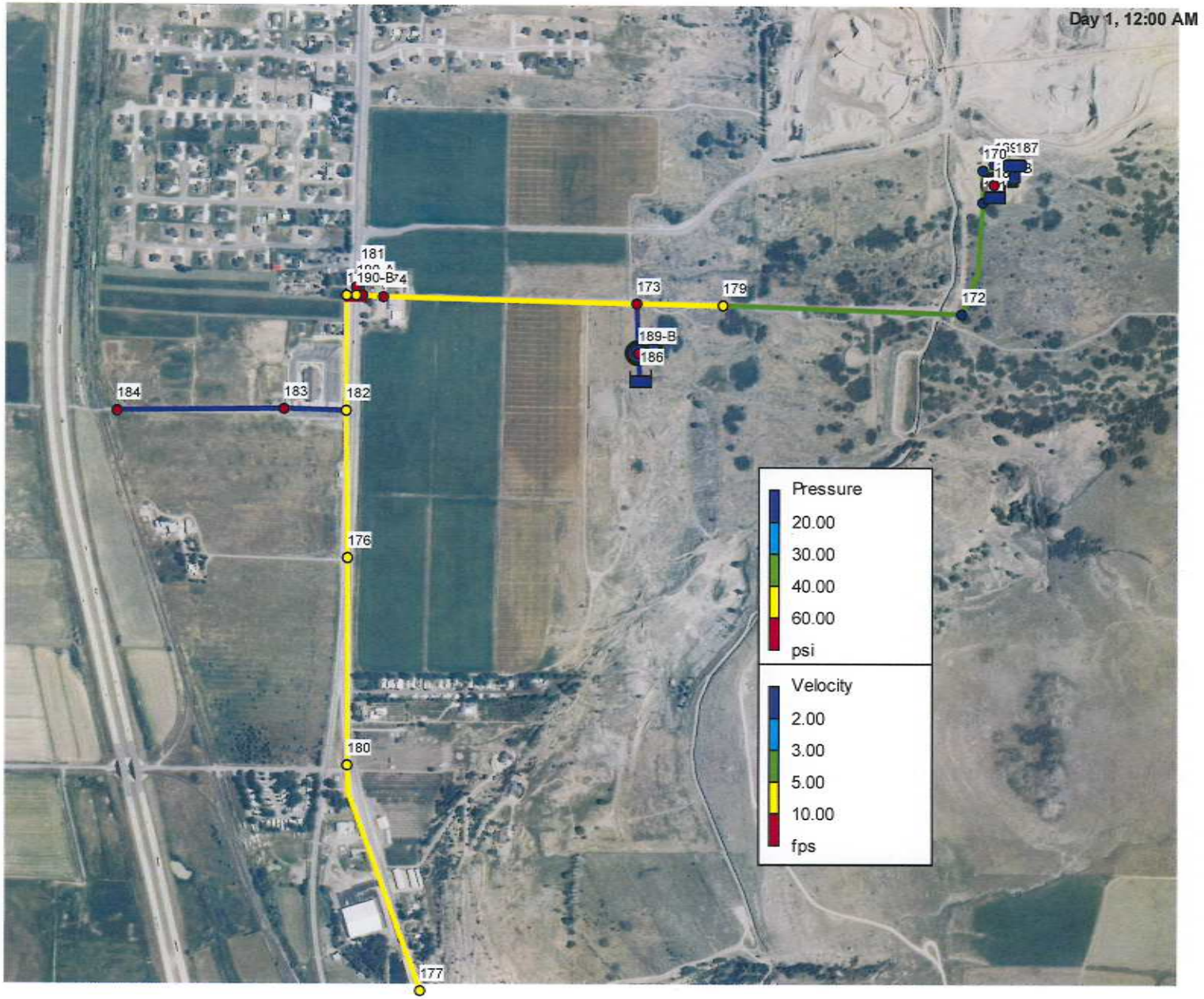
Appendix B

Water System Computer Model Data

Scenario: Peak Day + 2,000 GPM Fire Flow



Scenario: Peak Day + 2,000 GPM Fire Flow

Network Table - Nodes

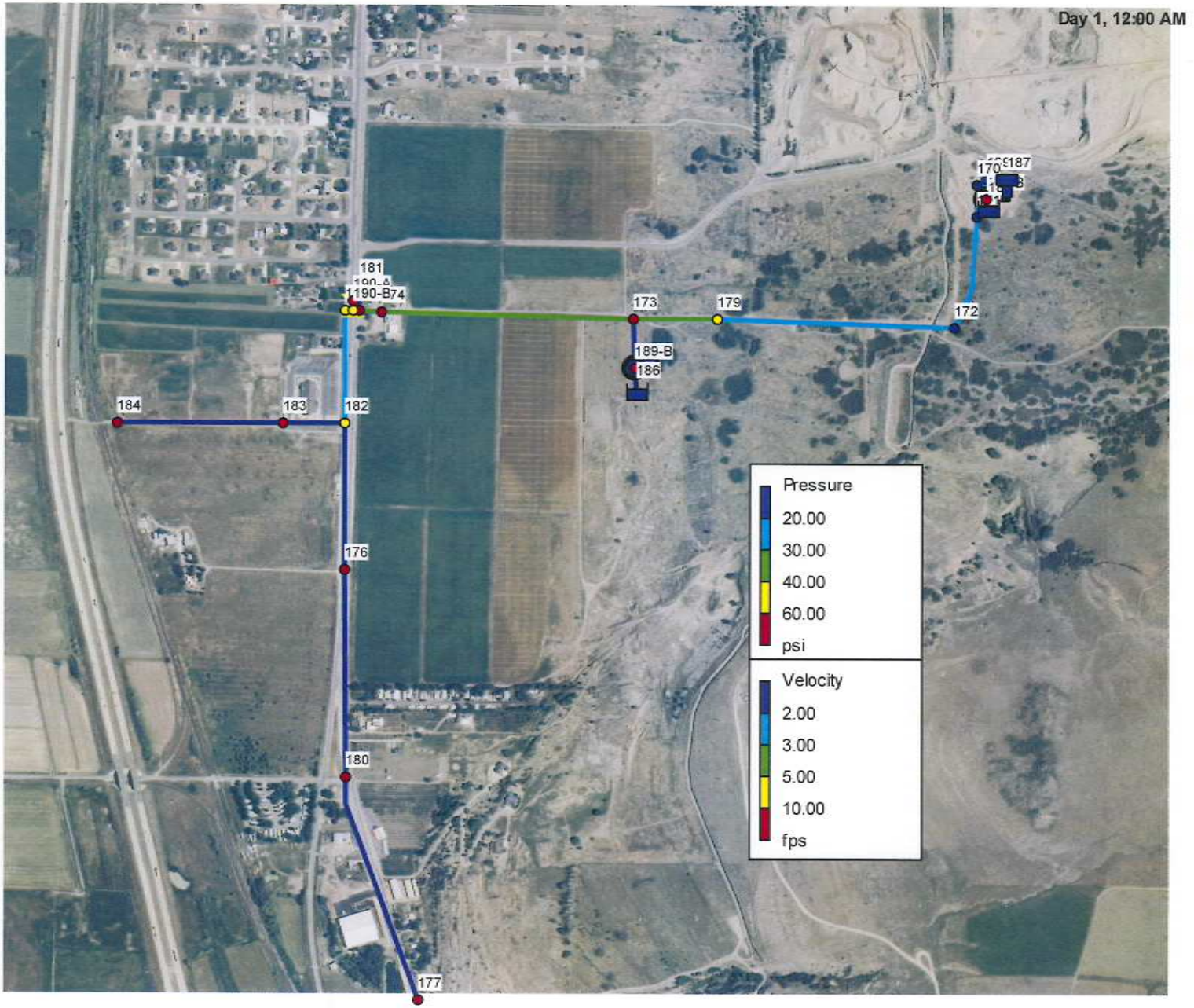
Node ID	Demand GPM	Pressure psi
Junc 169	0.00	4.79
Junc 170	0.00	15.14
Junc 171	0.00	14.70
Junc 172	0.00	13.07
Junc 173	83.00	82.92
Junc 174	83.00	112.25
Junc 175	83.00	59.63
Junc 176	83.00	57.77
Junc 177	2083.00	54.31
Junc 178	83.00	111.20
Junc 179	83.00	48.62
Junc 180	83.00	58.37
Junc 181	33.00	111.20
Junc 182	83.00	53.99
Junc 183	83.00	60.80
Junc 184	83.00	63.31
Junc 190-A	0.00	110.92
Junc 190-B	0.00	60.00
Junc 188-A	0.00	43.07
Junc 188-B	0.00	173.54
Junc 189-A	0.00	43.24
Junc 189-B	0.00	127.95
Resvr 185	-446.89	0.00
Resvr 186	0.00	0.00
Tank 187	-2499.11	0.43

Scenario: Peak Day + 2,000 GPM Fire Flow

Network Table - Links

Link ID	Length ft	Diameter in	Flow GPM	Velocity fps	Status
Pipe 191	100	8	446.89	2.85	Open
Pipe 192	400	12	446.89	1.27	Open
Pipe 193	152	12	446.89	1.27	Open
Pipe 194	215	16	2946.00	4.70	Open
Pipe 195	222	16	2946.00	4.70	Open
Pipe 196	813	16	2946.00	4.70	Open
Pipe 197	1792	12	2780.00	7.89	Open
Pipe 198	100	12	0.00	0.00	Open
Pipe 199	300	12	0.00	0.00	Closed
Pipe 200	58	12	2581.00	7.32	Open
Pipe 201	152	12	2697.00	7.65	Open
Pipe 202	44	12	2581.00	7.32	Open
Pipe 203	1687	16	2946.00	4.70	Open
Pipe 204	601	12	2863.00	8.12	Open
Pipe 205	1471	12	2166.00	6.14	Open
Pipe 206	1676	12	2083.00	5.91	Open
Pipe 207	172	8	33.00	0.21	Open
Pipe 208	800	12	2498.00	7.09	Open
Pipe 209	1035	12	2249.00	6.38	Open
Pipe 210	433	8	166.00	1.06	Open
Pipe 211	1200	8	83.00	0.53	Open
Pump 188	#N/A	#N/A	446.89	0.00	Open
Pump 189	#N/A	#N/A	0.00	0.00	Closed
Valve 190	#N/A	8	2581.00	16.47	Active

Scenario: Peak Instantaneous



Scenario: Peak Instantaneous

Network Table - Nodes

Node ID	Demand GPM	Pressure psi
Junc 169	0.00	5.03
Junc 170	0.00	15.43
Junc 171	0.00	15.28
Junc 172	0.00	14.76
Junc 173	143.00	90.17
Junc 174	143.00	129.26
Junc 175	143.00	59.94
Junc 176	143.00	66.42
Junc 177	143.00	74.89
Junc 178	143.00	129.04
Junc 179	143.00	52.58
Junc 180	143.00	72.77
Junc 181	33.00	129.03
Junc 182	143.00	58.41
Junc 183	143.00	65.04
Junc 184	143.00	67.41
Junc 190-A	0.00	128.99
Junc 190-B	0.00	60.00
Junc 188-A	0.00	43.07
Junc 188-B	0.00	174.38
Junc 189-A	0.00	43.24
Junc 189-B	0.00	131.57
Resvr 185	-446.35	0.00
Resvr 186	0.00	0.00
Tank 187	-1159.65	0.43

Scenario: Peak Instantaneous

Network Table - Links

Link ID	Length ft	Diameter in	Flow GPM	Velocity fps	Status
Pipe 191	100	8	446.35	2.85	Open
Pipe 192	400	8	446.35	2.85	Open
Pipe 193	151.956944556559	8	446.35	2.85	Open
Pipe 194	214.552908058589	16	1606.00	2.56	Open
Pipe 195	222.154615110252	16	1606.00	2.56	Open
Pipe 196	813.448965844699	16	1606.00	2.56	Open
Pipe 197	1792.04781677928	12	1320.00	3.74	Open
Pipe 198	100	12	0.00	0.00	Open
Pipe 199	300	12	0.00	0.00	Closed
Pipe 200	57.7143338408787	12	1001.00	2.84	Open
Pipe 201	152.389865353102	12	1177.00	3.34	Open
Pipe 202	44.2013153349225	12	1001.00	2.84	Open
Pipe 203	1687.20305980111	16	1606.00	2.56	Open
Pipe 204	600.673308863458	12	1463.00	4.15	Open
Pipe 205	1471.42785314684	12	286.00	0.81	Open
Pipe 206	1675.54289650901	12	143.00	0.41	Open
Pipe 207	172.035713977476	8	33.00	0.21	Open
Pipe 208	800.115839418559	12	858.00	2.43	Open
Pipe 209	1034.65321509856	12	429.00	1.22	Open
Pipe 210	433.70323069623	8	286.00	1.83	Open
Pipe 211	1200	8	143.00	0.91	Open
Pump 188	#N/A	#N/A	446.35	0.00	Open
Pump 189	#N/A	#N/A	0.00	0.00	Closed
Valve 190	#N/A	8	1001.00	6.39	Active