City of Yreka
Supply Reliability Certification

SELF CERTIFICATION NOTES:

This Support Analysis and Calculation spreadsheet includes both supply and production calculations as required by the State Water Resources Control Board. A description of the items included in the analysis, additional notes from the Water Supply Reliability Certification and Data Submission Form, and sample conversion calculations are included below.

An additional worst-case analysis is included within the "Fall Creek Historic Flows" tab of this spreadsheet. This analysis indicates that even under the worst case (lowest recorded Fall Creek flows), the City still has adequate supply.

Description of Items Included in the Support Analysis and Calculations Spreadsheet

"Supply Summary" includes historic monthly supply as well as projected annual available water calculations. Data sources and assumptions are included with the table.

"Production Summary" includes historic water demand measurements as well as projected demand. Data sources and assumptions are included with the table.

"Fall Creek Historic Flows" includes all available Fall Creek flow data. A water availability calculation based on the lowest recorded Fall Creek monthly flow and 2013 and 2014 demands is also included. This worst-case analysis shows adequate supply. Data sources and assumptions are included with the table.

LEGEND

Designates data used in Worksheet 1

Designates data used in Water Supply Reliability Certification and Data Submission Form

Additional Notes from the Water Supply Reliability Certification and Data Submission Form

Line No.	Description	Link
38	Production volume based on raw water master meter exported from City SCADA system, see Production Summary tab.	SCADA system is for internal use only. No link is available.
84	Available water supply based on Permit 15379, Item 5 and assumptions noted on Supply Summary Tab. Permit allows for a maximum diversion of 15 CFS, not to exceed 6,300 AC-FT per year.	City of Yreka Fall Creek Diversion Permit

Sample Conversion Calculations

Equation:

$$Flow\ [Million\ Gallons\ Per\ Year] = 15\ \frac{Ft^3}{Seconds} \times \frac{7.48\ Gallons}{1\ Ft^3} \times \frac{60\ Seconds}{1\ Minute} \times \frac{60\ Minutes}{1\ Hour} \times \frac{24\ Hours}{1\ Day} \times \frac{365\ Days}{1\ Year} = 3{,}538.3\ \text{MG per Year}$$

$$Flow\ [Acre\ Feet\ per\ Year] = 15\ \frac{Ft^3}{Seconds} \times \frac{60\ Seconds}{1\ Minute} \times \frac{60\ Minutes}{1\ Hour} \times \frac{24\ Hours}{1\ Day} \times \frac{365\ Days}{1\ Year} \times \frac{1\ Acre}{43{,}560\ Ft^2} = 10{,}859.5\ \text{AC} - \text{FT per Year}$$

Excel Calculation:

3538.3 MG
10859.5 AC-FT

City of Yreka
Supply Reliability Certification
Supply Summary

Historic Water Source Monthly Water Log

Month	Fall Creek Gaging Station Level [Ft][1]	Fall Creek Flow [CFS][2]	Raw Water Use [CFS][3]	Water Remaining In Fall Creek [CFS][4]	Water Supply Adequate [YES/NO][5]	Notes[6]
Jan-14					n/a	Fall Creek flow measurements unavailable
Feb-14					n/a	Fall Creek flow measurements unavailable
Mar-14					n/a	Fall Creek flow measurements unavailable
Apr-14					n/a	Fall Creek flow measurements unavailable
May-14					n/a	Fall Creek flow measurements unavailable
Jun-14	1.36	35.2	4.61	30.6	YES	Fall Creek measured and calibrated 6/12/14. See Note 2
Jul-14	1.32	33.6	5.43	28.2	YES	
Aug-14	1.32	33.6	4.51	29.1	YES	
Sep-14	1.36	35.2	3.83	31.4	YES	
Oct-14	1.36	35.2	2.44	32.8	YES	
Nov-14	1.37	35.6	1.56	34.0	YES	
Dec-14	1.40	36.2	1.83	34.4	YES	
Jan-15	1.48	40.4	1.77	38.6	YES	
Feb-15	1.44	39.0	1.52	37.5	YES	
Mar-15	1.32	33.6	1.83	31.8	YES	
Apr-15	1.28	32.0	2.30	29.7	YES	
May-15	1.26	31.2	2.96	28.2	YES	
Jun-15	1.24	30.5	4.32	26.2	YES	
Jul-15	1.16	27.4	4.71	22.7	YES	
Aug-15	1.26	31.2	4.50	26.7	YES	
Sep-15	1.29	32.4	3.76	28.6	YES	
Oct-15	1.30	32.8	2.87	29.9	YES	
Nov-15	1.30	32.8	1.63	31.2	YES	
Dec-15	1.30	32.8	1.84	31.0	YES	
Jan-16	1.33	34	1.70	32.3	YES	
Feb-16	1.48	40.4	1.43	39.0	YES	
Mar-16	1.50	41.2	1.55	39.6	YES	
Apr-16	1.24	30.5	1.99	28.5	YES	
May-16	1.20	28.6	3.00	25.6	YES	
Jun-16	1.20	28.6			n/a	Water use not yet available

Note:

(1) Reads taken monthly on or near the 1st of each month. Reads taken after a minimum of 30 minutes after raw water pumps are shut down to ensure stream is flowing at normal levels.

(2) Based on Fall Creek Gauging Station Rating Curve. Curve developed in 2014 by PACE Engineering. See Rating Curve (pg 4).

(3) Based on monthly raw water master meter totals. Data exported from City SCADA. No link to City SCADA is available. City SCADA is for internal use only.

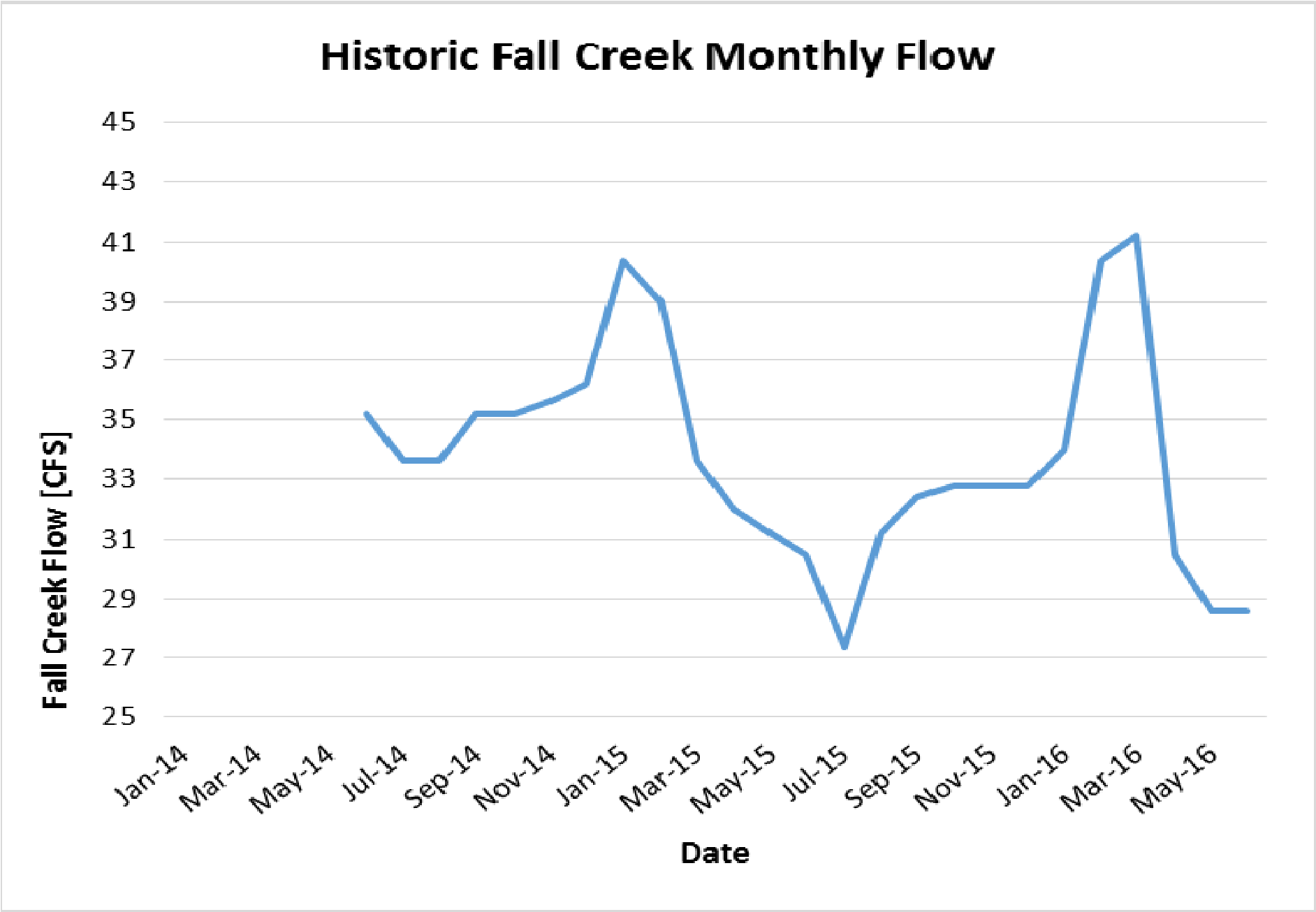
(4) Based on monthly Fall Creek flow and raw water master meter totals. City Diversion Permit requires 15 CFS to remain in Fall Creek during pumping. See permit link on Notes page (Pg 1) and raw water totals on Production Summary page.

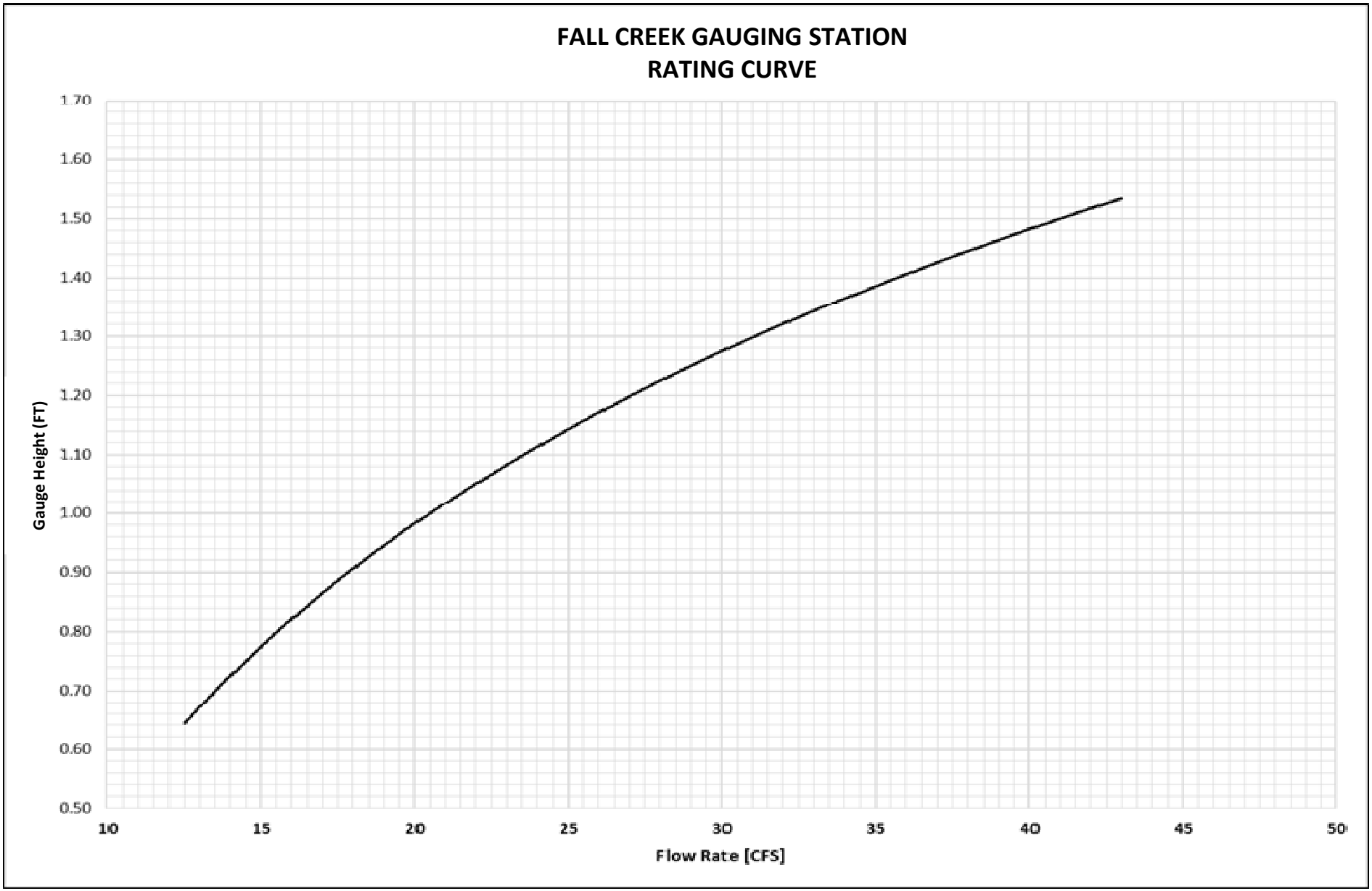
(5) Based on monthly water use, monthly Fall Creek flow measurements, and 15 CFS remaining in Fall Creek per Diversion Permit. See permit link on Notes page.

(6) Prior to 6/12/14, only limited Fall Creek flow data is available. This historic data includes the periods of April 4, 1933 to September 30, 1959 and May 1, 2003 to September 30, 2005. Data for 1933 to 1959 indicates minimum average monthly water supply is 33 CFS occurring in August.

USGS 1933-1959 Fall Creek Data

USGS 2003-2005 Fall Creek Data


Historic Fall Creek Monthly Flow
Fall Creek Flow [CFS]
45
43
41
39
37
35
33
31
29
27
25
Jan-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Jan-15
Mar-15
May-15
Jul-15
Sep-15
Nov-15
Jan-16
Mar-16
May-16
Date


FALL CREEK GAUGING STATION
RATING CURVE
Gauge Height (FT)
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
10
15
20
25
30
35
40
45
50
Flow Rate [CFS]

City of Yreka
Supply Reliability Certification
Supply Summary
Projected Monthly Water Source Calculations

Month	Fall Creek Flow [CFS][1]	Raw Water Use [CFS][2]	Water Remaining in Fall Creek [CFS][3]	Water Supply Adequate [YES/NO][4]	Notes
Oct-16	35.2	3.16	32.0	YES	Oct 2012 Fall Creek flow measurements unavailable, assumed to be equivalent to Oct 2014
Nov-16	35.6	3.16	32.4	YES	Nov 2012 Fall Creek flow measurements unavailable, assumed to be equivalent to Nov 2014
Dec-16	36.2	3.16	33.0	YES	Dec 2012 Fall Creek flow measurements unavailable, assumed to be equivalent to Dec 2014
Jan-17	40.4	3.16	37.2	YES	Jan 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Jan 2015
Feb-17	39	3.16	35.8	YES	Feb 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Feb 2015
Mar-17	33.6	3.16	30.4	YES	Mar 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Mar 2015
Apr-17	32	3.16	28.8	YES	Apr 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Apr 2015
May-17	31.2	3.16	28.0	YES	May 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to May 2015
Jun-17	30.5	3.16	27.3	YES	Jun 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Jun 2015
Jul-17	27.4	3.16	24.2	YES	Jul 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Jul 2015
Aug-17	31.2	3.16	28.0	YES	Aug 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Aug 2015
Sep-17	32.4	3.16	29.2	YES	Sep 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Sep 2015
Oct-17	32.8	3.16	29.6	YES	Oct 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Oct 2015
Nov-17	32.8	3.16	29.6	YES	Nov 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Nov 2015
Dec-17	32.8	3.16	29.6	YES	Dec 2013 Fall Creek flow measurements unavailable, assumed to be equivalent to Dec 2015
Jan-18	40.4	3.16	37.2	YES	Jan 2014 Fall Creek flow measurements unavailable, assumed to be equivalent to Jan 2015
Feb-18	39	3.16	35.8	YES	Feb 2014 Fall Creek flow measurements unavailable, assumed to be equivalent to Feb 2015
Mar-18	33.6	3.16	30.4	YES	Mar 2014 Fall Creek flow measurements unavailable, assumed to be equivalent to Mar 2015
Apr-18	32	3.16	28.8	YES	Apr 2014 Fall Creek flow measurements unavailable, assumed to be equivalent to Apr 2015
May-18	31.2	3.16	28.0	YES	May 2014 Fall Creek flow measurements unavailable, assumed to be equivalent to May 2015
Jun-18	35.2	3.16	32.0	YES	Assumed to be equivalent to Jun 2014
Jul-18	33.6	3.16	30.4	YES	Assumed to be equivalent to Jul 2014
Aug-18	33.6	3.16	30.4	YES	Assumed to be equivalent to Aug 2014
Sep-18	35.2	3.16	32.0	YES	Assumed to be equivalent to Sep 2014
Oct-18	35.2	3.16	32.0	YES	Assumed to be equivalent to Oct 2014
Nov-18	35.6	3.16	32.4	YES	Assumed to be equivalent to Nov 2014
Dec-18	36.2	3.16	33.0	YES	Assumed to be equivalent to Dec 2014
Jan-19	40.4	3.16	37.2	YES	Assumed to be equivalent to Jan 2015
Feb-19	39	3.16	35.8	YES	Assumed to be equivalent to Feb 2015
Mar-19	33.6	3.16	30.4	YES	Assumed to be equivalent to Mar 2015
Apr-19	32	3.16	28.8	YES	Assumed to be equivalent to Apr 2015
May-19	31.2	3.16	28.0	YES	Assumed to be equivalent to May 2015
Jun-19	30.5	3.16	27.3	YES	Assumed to be equivalent to Jun 2015
Jul-19	27.4	3.16	24.2	YES	Assumed to be equivalent to Jul 2015
Aug-19	31.2	3.16	28.0	YES	Assumed to be equivalent to Aug 2015
Sep-19	32.4	3.16	29.2	YES	Assumed to be equivalent to Sep 2015
Oct-19	32.8	3.16	29.6	YES	Assumed to be equivalent to Oct 2015
Nov-19	32.8	3.16	29.6	YES	Assumed to be equivalent to Nov 2015
Dec-19	32.8	3.16	29.6	YES	Assumed to be equivalent to Dec 2015

Note:

(1) Based on Fall Creek Gaging Station Rating Curve. Curve developed by 2014 PACE Engineering field calibration. See Rating Curve(Pg 4). Flow based on assumption in Note field.

(2) Based on average annual raw water use of calendar years 2014 and 2015. See calculation on Production Summary tab, Cell C25.

(3) Based on monthly Fall Creek flow and raw water master meter totals. City Diversion Permit requires 15 CFS to remain in Fall Creek during pumping. See permit link on Supply Calculation and Production Summary tabs.

(4) Adequacy of water supply based on monthly water use, monthly Fall Creek flow measurements, and 15 CFS remaining in Fall Creek per Diversion Permit. See permit link on Notes tab.

Projected Annual Water Availability Calculations

Water Year	Fall Creek Flow [AC-FT][1]	Water to Remain in Creek [AC-FT][2]	Maximum Water Right [AC-FT][3]	Total Available Water [AC-FT][4]	Surplus Fall Creek Water Supply [CFS][5]
WY 2017	24,199	10,860	6,300	6,300	7,039
WY 2018	24,647	10,860	6,300	6,300	7,488
WY 2019	24,199	10,860	6,300	6,300	7,039

Note:

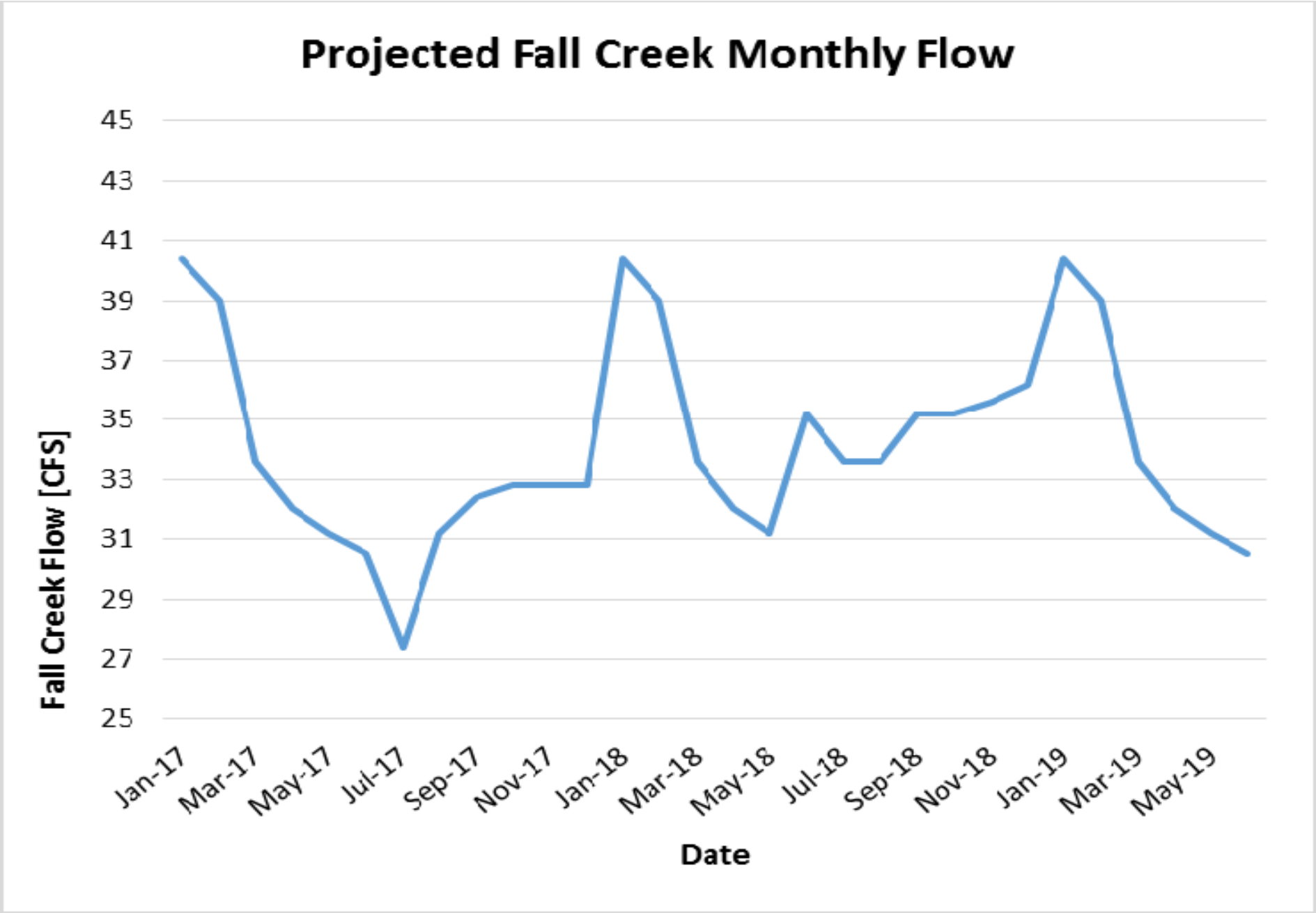
(1) Based on Projected Monthly Water Source Calculations table and assumption therein.

(2) Based on City Diversion permit. See permit link on Notes. 15 CFS to remain in Fall Creek during pumping.

(3) Based on City Diversion permit. See permit link on Notes tab. City allowed to divert a maximum of 15 CFS not to exceed 6,300 AC-FT per year.

(4)Based on the difference of Fall Creek flow (See Note 1) and Water to Remain in Creek (See Note 2). Difference not allowed to exceed City's Maximum Water Right (See note 3).

(5) Based on Monthly Water Source Calculations table and assumption therein. Calculation accounts for City's Diversion Permit required 15 CFS to remain in Fall Creek during pumping and 6,300 AC-Ft maximum available water right per year. See permit link on Notes tab.


Projected Fall Creek Monthly Flow
45
43
41
39
37
35
33
31
29
27
25
Fall Creek Flow [CFS]
Jan-17
Mar-17
May-17
Jul-17
Sep-17
Nov-17
Jan-18
Mar-18
May-18
Jul-18
Sep-18
Nov-18
Jan-19
Mar-19
May-19
Date

City of Yreka
Supply Reliability Certification
Production Summary

HISTORIC RAW WATER MONTHLY DEMAND TOTALS[1]

YEAR:	2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016	
MONTH	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]	[MG]	[CFS]
January	47.3	2.4	55.9	2.8	48.2	2.5	50.5	2.6	43.2	2.2	40.4	2.1	38.8	2.0	39.7	2.0	42.0	2.1	46.6	2.4	39.4	2.0	34.9	1.8	33.5	1.7
February	44.7	2.3	48.4	2.5	45.2	2.3	36.7	1.9	42.8	2.2	33.8	1.7	34.2	1.7	33.4	1.7	33.6	1.7	34.6	1.8	31.9	1.6	30.0	1.5	28.1	1.4
March	52.5	2.7	54.4	2.8	52.1	2.7	47.0	2.4	45.1	2.3	38.5	2.0	38.3	1.9	37.8	1.9	37.2	1.9	38.9	2.0	33.8	1.7	35.9	1.8	30.6	1.6
April	80.0	4.1	56.5	2.9	54.0	2.7	56.7	2.9	53.5	2.7	57.6	2.9	42.6	2.2	37.0	1.9	41.0	2.1	52.2	2.7	46.5	2.4	45.3	2.3	39.1	2.0
May	93.3	4.7	61.9	3.1	94.0	4.8	91.8	4.7	90.3	4.6	86.7	4.4	54.8	2.8	59.8	3.0	81.3	4.1	81.3	4.1	75.2	3.8	58.1	3.0	59.0	3.0
June	130.8	6.7	97.5	5.0	118.2	6.0	116.8	5.9	102.3	5.2	86.5	4.4	92.5	4.7	82.1	4.2	89.0	4.5	101.7	5.2	90.7	4.6	84.9	4.3		
July	143.4	7.3	143.1	7.3	142.5	7.2	116.0	5.9	137.0	7.0	139.7	7.1	129.6	6.6	108.1	5.5	115.5	5.9	125.2	6.4	106.8	5.4	92.6	4.7		
August	136.8	7.0	141.3	7.2	125.2	6.4	126.0	6.4	125.3	6.4	123.5	6.3	123.0	6.3	117.9	6.0	117.4	6.0	105.8	5.4	88.7	4.5	88.5	4.5		
September	114.6	5.8	106.6	5.4	112.9	5.7	97.5	5.0	106.3	5.4	107.0	5.4	92.7	4.7	99.2	5.0	94.2	4.8	75.8	3.9	75.3	3.8	74.0	3.8		
October	80.3	4.1	77.5	3.9	75.2	3.8	49.2	2.5	65.9	3.4	58.0	2.9	63.8	3.2	48.9	2.5	60.7	3.1	48.4	2.5	48.0	2.4	56.4	2.9		
November	48.8	2.5	43.1	2.2	56.2	2.9	34.7	1.8	36.1	1.8	37.0	1.9	35.8	1.8	37.4	1.9	37.7	1.9	35.9	1.8	30.7	1.6	32.0	1.6		
December	47.5	2.4	54.2	2.8	55.1	2.8	41.3	2.1	47.6	2.4	41.7	2.1	39.7	2.0	42.7	2.2	36.3	1.8	43.7	2.2	35.9	1.8	36.2	1.8		
Total	**1019.9**	**51.9**	**940.3**	**47.8**	**978.8**	**49.8**	**864.1**	**44.0**	**895.4**	**45.5**	**850.4**	**43.3**	**785.7**	**40.0**	**743.9**	**37.8**	**785.8**	**40.0**	**790.2**	**40.2**	**702.8**	**35.8**	**668.6**	**34.0**	**190.3**	**9.7**

Note:
(1) Based on monthly raw water master meter totals. Raw water meter includes all water taken from Fall Creek. Data exported from City SCADA in units of million gallons [MG]. Water volumes converted to CFS using standard conversions and average days per month (i.e., 1 month = 30.1466 days). Link to City SCADA is not possible. City SCADA system is for internal use only.

PROJECTED WATER DEMAND

	MG	CFS
Calendar Year 2013	790.2	40.2
Calendar Year 2014	702.8	35.8
Average Annual Total[1]	746.5	38.0
Monthly Average	62.2	3.2

Note:
(1) Average base CCR Title 23, Article 22.5, Sec 864.4, (3) requirements.

HISTORIC FALL CREEK GAUGING STATION DATA [1]

YEAR	Monthly mean in CFS (Calculation Period: 1933-04-01 -> 1959-09-30)												Source	Link/Note
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
1933	#N/A	#N/A	#N/A	36.10	34.60	32.40	31.10	30.10	29.00	31.00	32.20	33.40	USGS	USGS 1933-1959 Fall Creek Data
1934	33.10	31.10	31.20	31.40	31.20	30.20	29.70	29.30	27.60	31.80	38.10	35.00	USGS	USGS 1933-1959 Fall Creek Data
1935	37.30	38.00	33.90	33.90	30.30	29.00	28.90	28.40	29.40	29.20	30.00	32.60	USGS	USGS 1933-1959 Fall Creek Data
1936	62.40	43.70	35.00	30.40	26.90	27.20	26.40	26.30	27.50	28.30	29.60	28.20	USGS	USGS 1933-1959 Fall Creek Data
1937	28.30	31.30	55.30	58.70	29.00	26.00	24.60	24.60	25.60	27.50	38.20	46.30	USGS	USGS 1933-1959 Fall Creek Data
1938	37.90	49.10	66.70	61.80	34.80	28.30	28.20	27.90	28.30	29.50	29.80	30.40	USGS	USGS 1933-1959 Fall Creek Data
1939	30.10	31.60	34.50	29.80	28.70	27.80	28.40	28.10	29.00	28.00	29.00	32.70	USGS	USGS 1933-1959 Fall Creek Data
1940	34.20	43.80	44.30	37.10	29.20	27.20	27.80	27.40	28.60	29.60	29.60	32.80	USGS	USGS 1933-1959 Fall Creek Data
1941	33.10	36.70	29.90	31.50	30.20	29.20	28.30	28.30	29.30	29.20	30.80	39.70	USGS	USGS 1933-1959 Fall Creek Data
1942	38.80	44.10	33.60	33.80	34.10	31.20	29.90	29.90	30.40	31.40	39.60	53.40	USGS	USGS 1933-1959 Fall Creek Data
1943	60.30	69.00	57.50	44.10	36.90	34.40	33.90	33.30	34.00	35.50	36.30	35.50	USGS	USGS 1933-1959 Fall Creek Data
1944	36.70	39.20	40.50	36.50	32.60	31.30	30.30	30.10	32.10	33.50	38.10	38.80	USGS	USGS 1933-1959 Fall Creek Data
1945	40.00	54.90	45.00	42.90	40.80	36.90	32.10	32.20	33.80	34.20	36.50	49.40	USGS	USGS 1933-1959 Fall Creek Data
1946	57.90	45.30	54.80	41.50	35.10	32.70	33.10	33.00	34.10	34.20	34.50	34.90	USGS	USGS 1933-1959 Fall Creek Data
1947	34.90	38.40	37.10	36.50	34.40	34.10	33.10	32.30	33.00	34.00	35.40	34.90	USGS	USGS 1933-1959 Fall Creek Data
1948	48.70	37.60	43.00	48.00	41.00	36.10	34.40	31.90	31.30	32.40	33.80	36.00	USGS	USGS 1933-1959 Fall Creek Data
1949	30.60	40.80	49.70	46.50	35.00	30.60	30.60	31.10	34.20	35.40	34.90	33.40	USGS	USGS 1933-1959 Fall Creek Data
1950	39.20	50.20	55.00	48.80	36.70	34.80	34.10	33.50	34.80	39.60	38.00	50.50	USGS	USGS 1933-1959 Fall Creek Data
1951	46.00	65.30	51.40	46.10	37.80	34.60	34.80	33.60	34.10	35.90	39.60	52.40	USGS	USGS 1933-1959 Fall Creek Data
1952	44.00	66.40	64.10	67.20	41.60	37.50	35.50	36.00	35.30	37.10	39.70	42.70	USGS	USGS 1933-1959 Fall Creek Data
1953	67.10	58.80	54.10	54.70	47.50	44.00	40.10	39.20	35.40	36.60	44.60	46.70	USGS	USGS 1933-1959 Fall Creek Data
1954	62.10	68.20	59.70	50.60	43.80	42.20	39.60	40.40	41.30	43.00	40.30	42.60	USGS	USGS 1933-1959 Fall Creek Data
1955	46.30	45.60	43.80	43.60	42.10	41.00	41.00	41.10	41.50	39.90	44.90	91.80	USGS	USGS 1933-1959 Fall Creek Data
1956	92.10	70.60	73.30	70.80	59.40	56.20	47.70	43.20	43.90	47.80	45.30	50.70	USGS	USGS 1933-1959 Fall Creek Data
1957	50.90	67.90	75.70	57.20	48.30	42.60	44.80	46.40	46.90	48.00	57.20	63.20	USGS	USGS 1933-1959 Fall Creek Data
1958	72.20	101.10	64.50	57.80	55.10	49.20	40.50	36.50	41.80	43.40	43.00	43.60	USGS	USGS 1933-1959 Fall Creek Data
1959	44.20	46.60	44.90	44.50	43.50	42.20	41.70	45.50	46.00	#N/A	#N/A	#N/A	USGS	USGS 1933-1959 Fall Creek Data
1960	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1961	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1962	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1963	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1964	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1965	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1966	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1967	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1968	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1969	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1970	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1971	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1972	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1973	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1974	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1975	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1976	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1977	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1978	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1979	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1980	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1981	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1982	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1983	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1984	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1985	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1986	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1987	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1988	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1989	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1990	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1991	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1992	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1993	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1994	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1995	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1996	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1997	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1998	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
1999	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2001	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2002	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2003	#N/A	#N/A	#N/A	#N/A	37.97	30.59	29.29	29.83	32.04	40.94	51.02	46.83	USGS	USGS 2003-2005 Fall Creek Data
2004	44.58	57.68	69.38	48.32	39.64	31.77	25.02	23.59	26.65	42.17	53.85	52.14	USGS	USGS 2003-2005 Fall Creek Data
2005	45.01	43.43	41.31	40.58	46.20	35.79	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	USGS	USGS 2003-2005 Fall Creek Data
2006	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2007	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2008	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2009	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2010	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2011	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2012	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2013	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		Data not available
2014	#N/A	#N/A	#N/A	#N/A	#N/A	35.20	33.60	33.60	35.20	35.20	35.60	36.20	City SCADA	No link available[2]
2015	40.40	39.00	33.60	32.00	31.20	30.50	27.40	31.20	32.40	32.80	32.80	32.80	City SCADA	No link available[2]
2016	34.00	40.40	41.20	30.50	28.60	28.60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	City SCADA	No link available[2]
Mean of Monthly Discharge	45.7	49.9	48.8	44.3	37.6	34.6	33.1	32.8	33.7	35.2	38.1	42.7		Historic Average
Min Monthly Flow	28.3	31.1	29.9	29.8	26.9	26	27.4	23.5914	25.6	27.5	29	28.2		Lowest Recorded Monthly Flow

Note

(1) Data taken from USGS gauging station 11512000. Prior to 6/12/14 only limited Fall Creek flow data is available. This historic data includes the periods of April 4, 1933 to September 30, 1959 and May 1, 2003 to September 30, 2005. 1933 to 1959 data indicates minimum average monthly water supply is 33 CFS occurring in August.

(2) Data exported from City SCADA. City SCADA is for internal use only. No link is available

Water Availability Calculations - Worst Year On Record

Description	Fall Creek Flow [AC-FT](1)	Water to Remain in Creek [AC-FT](2)	Maximum Water Right [AC-FT](3)	Total Available Water [AC-FT](4)	Projected Demand [AC-FT](5)	Surplus Fall Creek Water Supply [AC-FT](6)
Historic Worst-Case Water Year	19,929	10,860	6,300	6,300	190.9	8,879

Note:

(1) Based on lowest recorded monthly flow. See Historic Creek Gauging Station Data table above.

(2) Based on City Diversion permit. See permit link on Notes page. 15 CFS to remain in Fall Creek during pumping.

(3) Based on City Diversion permit. See permit link on Notes page. City allowed to divert a maximum of 15 CFS, not to exceed 6,300 AC-Ft per year.

(4) Based on the difference of Fall Creek flow (See Note 1) and Water to Remain in Creek (See Note 2). Difference not allowed to exceed City's Maximum Water Right (See Note 3).

(5) Based on the average demand of calendar years 2013 and 2015.

(6) Based on Monthly Water Source Calculations table and assumption therein. Calculation accounts for City's Diversion Permit required 15 CFS to remain in Fall Creek during pumping and 6,300 AC-Ft maximum available water right per year. See permit link on Notes page.