

**CITY OF SPOKANE,  
WASHINGTON**

**CSO FLOW MONITORING PROJECT**

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**FLOW, FREQUENCY AND DURATION**

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**SEWER MAINTENANCE**

**Monthly Report  
March 2019**

**April 5, 2019**  
*CSOMonthly2019-03.docx*

## OVERFLOW EVENTS

Table 1 – Flow-Frequency-Duration, provides a summary of the flow volume calculated for the overflow pipes at each site for each event recorded. The flow calculations are based on flow monitor recorded level and velocity measurements.

**Table 1 – Flow-Frequency-Duration**

Line No.	Regulator Location	CSO No.	Freq.	Date of event <sup>1</sup>	Estimated Total Flow (Gallons) <sup>2</sup>	Event Duration (Min. of Overflow)	Comments
1	AL Parkway Storage (West)	2	None				
2	NW Blvd @ Kiernan	6	None				
3	Columbia @ Downriver	7	None				
4	Nettleton @ York/Buckeye	10	None				
5	Nora @ Pettet	12	None				
6	Sherwood @ Summit	14	None				
7	Nettleton @ Ohio	15	None				
8	A @ Linton	16B	None				Missing data 03/25 12:50 to 03/25 12:55
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	None				Missing data 03/09 15:35 to 03/09 15:40 Missing data 03/11 11:05 to 03/11 11:10
11	Main @ Oak	22B	None				Missing data 03/11 08:10 to 03/11 08:15 Missing data 03/18 07:05 to 03/18 08:05

<sup>1</sup> Designation as an event means that both a level and velocity reading were recorded concurrently. Not all level and velocity readings that were coincident are included in this report, however. The level and velocity readings that appear to be “background noise” from the electronic equipment are not included in the table.

<sup>2</sup> The flows presented in this column are calculated from measurements of velocity and depth of flow by electronic devices inserted in the water stream. These measurements are subject to singular and possibly cumulative errors. These errors result from limitations inherent in the measuring devices and from the introduction of a measuring device in to the physical flow stream. Also, error in velocity and depth measurements may be and typically are introduced by the physical conditions of each site. The flow numbers presented in this table are estimates only.

Line No.	Regulator Location	CSO No.	Freq.	Date of event <sup>1</sup>	Estimated Total Flow (Gallons) <sup>2</sup>	Event Duration (Min. of Overflow)	Comments
12	Cedar @ Summit	23-1	None				Missing data 03/01 09:20 to 03/01 09:25 Missing data 03/07 10:25 to 03/07 10:50 Missing data 03/07 13:45 to 03/07 14:00 Missing data 03/07 14:10 to 03/07 14:15 Missing data 03/08 13:15 to 03/08 13:20 Missing data 03/08 13:45 to 03/08 13:50 Missing data 03/12 07:50 to 03/12 08:45 Missing data 03/13 12:20 to 03/13 12:25 Missing data 03/15 07:40 to 03/15 07:45 Missing data 03/15 08:35 to 03/15 08:40 Missing data 03/15 11:45 to 03/15 11:50 Missing data 03/18 12:35 to 03/18 13:30 Missing data 03/19 13:15 to 03/19 13:20 Missing data 03/25 02:05 to 03/25 02:10
15	1st @ Adams	24-1	None				
16	Cedar @ Main	25	None				Missing data 03/12 12:25 to 03/12 12:30 Missing data 03/28 09:35 to 03/28 09:40
17	Riverside @ Lincoln	26	2	Total	1,184,100	280	
				03/12	237,350	185	
				03/31	946,750	95	
19	Arthur @ 3rd	33C	1	Total	1,103	10	
				03/31	1,103	10	
20	Liberty Park (west end)	33-1	None				
21	Sprague Ave @ Sprague Wy	33-2	None				
22	Riverside @ Napa/Crestline	34	None				
23	S. Riverton @ Magnolia	38-1	None				
24	Rebecca @ Upriver	41	None				
25	Riverton @ Surro	42	None				
26	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
	Monthly Total		3		1185203	290	No Dry Weather Overflows No RPWRF CSO-Related Bypasses

**Table 2 – Rainfall Summary<sup>3</sup>**

Date	343 Rain	344 Rain	Shadle Rain	Hartson Rain	CityHall Rain	Joe_Albi Rain	RkwdVsta Rain	Station8 Rain	W_Drive Rain	Nora&Pet Rain	Lincoln Rain	Northeast Rain	GEG Rain	Snow	Dpth	NWS Rain	Snow	Dpth	SFF Rain
03/01/19	-	-	0.01	0.01	0.04	-	-	-	0.05	-	-	0.08	-	-	16.00	-	-	8.00	-
03/02/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.00	-	-	8.00	-
03/03/19	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	14.00	-	-	8.00	-
03/04/19	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	14.00	-	-	8.00	-
03/05/19	-	0.01	-	-	-	-	-	-	0.04	-	-	0.12	-	-	14.00	-	-	8.00	-
03/06/19	0.02	0.18	0.10	0.04	0.09	0.05	0.08	0.05	0.34	0.38	0.07	0.15	0.09	0.40	14.00	0.10	0.30	7.00	0.06
03/07/19	-	0.01	-	0.01	0.01	-	0.01	-	0.11	0.10	-	0.01	0.01	0.20	14.00	T	T	6.00	0.02
03/08/19	-	-	-	-	-	-	-	-	0.05	0.03	0.05	-	-	-	14.00	T	T	6.00	-
03/09/19	0.03	0.03	-	0.01	-	-	-	-	0.06	0.02	-	-	-	-	12.00	-	-	6.00	-
03/10/19	0.02	0.02	-	-	-	-	-	-	0.05	-	-	-	-	-	12.00	-	-	6.00	-
03/11/19	-	0.05	-	-	-	-	-	-	0.01	-	-	-	-	-	12.00	-	-	6.00	-
03/12/19	-	0.04	0.20	0.36	0.33	0.28	0.56	0.32	0.18	0.30	0.31	0.27	0.38	3.20	13.00	0.30	3.50	8.00	0.43
03/13/19	0.01	0.12	0.04	0.04	0.12	0.02	0.03	0.02	0.31	0.11	-	0.07	T	T	16.00	T	T	7.00	0.04
03/14/19	0.01	0.19	-	-	-	-	-	-	-	-	-	-	-	-	15.00	-	-	7.00	-
03/15/19	0.01	0.15	-	-	-	-	-	-	-	-	-	-	-	-	14.00	-	-	7.00	-
03/16/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.00	-	-	-	-
03/17/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.00	-	-	5.00	-
03/18/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	-	-	4.00	-
03/19/19	-	-	-	-	-	P	-	-	-	-	-	-	-	-	8.00	-	-	3.00	-
03/20/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.00	-	-	3.00	-
03/21/19	-	-	-	-	-	P	-	-	-	-	-	-	-	-	2.00	-	-	3.00	-
03/22/19	-	-	-	-	-	P	-	-	-	-	-	-	-	-	1.00	-	-	1.00	-
03/23/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	T	-
03/24/19	0.01	0.02	0.01	-	-	0.01	0.01	-	0.01	-	0.01	0.01	0.04	-	-	0.03	-	-	0.01
03/25/19	0.01	-	0.02	-	0.01	0.02	-	-	0.02	0.02	0.02	-	0.01	-	-	0.01	-	-	T
03/26/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03/27/19	-	-	-	-	-	-	-	-	-	-	-	-	T	M	-	T	-	-	T
03/28/19	0.09	0.08	0.07	0.07	0.10	0.05	0.14	0.05	0.13	0.09	0.02	0.02	0.14	-	-	0.14	-	-	0.04
03/29/19	0.01	-	-	-	-	-	-	-	-	-	-	-	T	-	-	0.01	-	-	-
03/30/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03/31/19	0.08	0.04	-	0.10	0.21	0.02	0.28	0.01	0.11	0.07	-	-	0.04	-	-	0.02	-	-	0.04
<b>Total</b>	<b>0.30</b>	<b>0.94</b>	<b>0.46</b>	<b>0.64</b>	<b>0.91</b>	<b>0.45P</b>	<b>1.11E</b>	<b>0.45</b>	<b>1.47</b>	<b>1.13</b>	<b>0.48</b>	<b>0.73</b>	<b>0.71</b>	<b>3.80</b>		<b>0.61</b>	<b>3.80</b>		<b>0.64</b>

E – Erroneous data

M – Missing Data

P – Partial Missing data

T – Trace of rain/snow

X – Out of Service

<sup>3</sup> Some rain gauges are heated. Consequently, they will tend to record snow melt immediately as rain. The rain gauges that are not heated will typically register snow melt when it actually melts.

**Table 3 – Rain Gauges**

343	23 <sup>rd</sup> & Ray
344	Division & Manito
Shadle	Shadle Water Tower (was 345)
Hartson	Ray & Hartson (was 346)
CityHall	City Hall (was 347)
Joe_Albi	Joe Albi Stadium
RkwdVsta	Rockwood Vista
Station8	Fire Station 8, Rebecca & Mission
W_Drive	West Drive Reservoir
Nora&Pet	Nora & Pettet
Lincoln	Lincoln Rd Lift Station
Northeast	Northeast Lift Station
GEG	Spokane Airport
NWS	National Weather Service – Spokane
SFF	Spokane Felts Field