

CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
September 2019**

**October 11, 2019
(Revised November 8, 2019)**
CSOMonthly2019-09_revised.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 ¹	Estimated Total Flow (Gallons) ²	Event Duration (Min. of Overflow)	Comments
1	AL Parkway Storage (West)	2	None				
2	NW Blvd @ Kiernan	6	None				Missing data 09/17 00:00 to 09/17 10:15
3	Columbia @ Downriver	7	1	Total	85,993	40	Missing data 09/06 12:20 to 09/06 12:25
				09/09	85,993	40	
4	Nettleton @ York/Buckeye	10	None				Missing data 09/06 11:50 to 09/06 12:15 Missing data 09/26 08:30 to 09/26 08:40
5	Nora @ Pettet	12	None				
6	Sherwood @ Summit	14	None				
7	Nettleton @ Ohio	15	None				
8	A @ Linton	16	None				
9	7th @ Inland Empire	19	None				
11	Main @ Oak	22B	None				Missing data 09/26 07:05 to 09/26 07:10
12	Cedar @ Summit	23-1	None				Missing data 09/11 09:15 to 09/11 09:20 Missing data 09/22 06:55 to 09/22 23:55 Missing data 09/23 06:45 to 09/23 06:50
15	1st @ Adams	24-1	None				

¹ 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.

² 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 ¹	Estimated Total Flow (Gallons) ²	Event Duration (Min. of Overflow)	Comments
16	Cedar @ Main	25	None				Missing data 09/16 12:20 to 09/16 12:25 Missing data 09/25 13:40 to 09/25 13:45
17	Riverside @ Lincoln	26	2	Total	716,583	290	Missing data 09/19 12:45 to 09/19 12:50
				09/08	214,515	85	
				09/28	502,068	205	
19	Arthur @ 3rd	33C	None				Missing data 09/14 20:00 to 09/14 20:05 Missing data 09/19 19:00 to 09/19 19:05
20	Liberty Park (west end)	33-1	None				
21	Sprague Ave @ Sprague Wy	33-2	None				
22	Riverside @ Napa/Crestline	34	None				Missing data 09/06 16:15 to 09/06 16:20 Missing data 09/07 08:20 to 09/07 08:25
23	S. Riverton @ Magnolia	38-1	None				
24	Rebecca @ Upriver	41	None				
25	Riverton @ Surro	42	None				Missing data 09/04 09:25 to 09/04 09:30
26	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
	Monthly Total		3		802,576	330	No Dry Weather Overflows No RPWRF CSO-Related Bypasses

Table 2 – Rainfall Summary³

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	Crest&Hoff Rain	GEG Rain	Snow	Dpth	NWS Rain	Snow	Dpth	SFF Rain
09/01/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/02/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/03/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/04/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/05/19	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/06/19	0.06	0.06	0.07	0.06	0.07	0.07	0.09	0.08	0.07	0.05	0.06	0.06	0.06	0.04	-	-	0.07	-	-	0.10
09/07/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/08/19	0.14	0.14	0.15	0.33	0.14	0.15	0.29	0.39	0.12	0.14	0.21	0.34	0.16	0.09	-	-	0.14	-	-	0.41
09/09/19	0.23	0.27	0.62	0.25	0.31	0.57	0.41	0.31	0.54	0.67	0.47	0.40	0.38	0.64	-	-	0.67	-	-	0.21
09/10/19	0.01	0.01	0.01	0.01	-	0.01	-	-	-	-	0.01	0.01	-	T	-	-	0.01	-	-	-
09/11/19	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	0.04	-	-	-
09/12/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/13/19	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	-	-
09/14/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/15/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/16/19	0.01	0.04	0.05	0.01	0.04	0.06	0.04	0.02	0.05	0.05	0.03	0.02	0.02	0.08	-	-	0.12	-	-	T
09/17/19	-	0.01	0.02	-	-	-	-	-	-	-	-	-	-	T	-	-	0.03	-	-	T
09/18/19	0.06	0.02	-	0.05	0.02	0.13	0.03	0.04	0.03	0.01	0.05	0.03	0.02	0.09	-	-	0.34	-	-	0.03
09/19/19	0.01	-	-	-	-	0.01	-	-	-	0.01	0.01	-	-	T	-	-	0.01	-	-	-
09/20/19	0.02	0.02	-	0.03	0.01	0.03	0.05	0.03	0.01	0.01	0.05	0.01	0.03	0.01	-	-	0.02	-	-	0.01
09/21/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/22/19	-	-	-	-	-	-	0.01	0.01	-	-	-	0.01	-	T	-	-	-	-	-	0.01
09/23/19	-	0.01	-	-	-	0.02	-	0.01	0.02	0.01	0.02	0.01	-	0.02	-	-	0.03	-	-	0.01
09/24/19	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	-	-
09/25/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/26/19	0.02	0.02	-	-	-	-	-	-	-	-	-	0.01	-	0.04	-	-	-	-	-	0.01
09/27/19	0.04	0.05	-	0.06	0.03	0.14	0.08	0.06	0.04	0.05	0.18	0.07	0.07	0.03	-	-	0.20	-	-	0.05
09/28/19	0.74	0.72	-	0.54	0.59	0.50	0.88	0.45	0.63	0.60	0.56	0.55	0.26	0.72	1.90	-	0.73	1.50	1.00	0.66
09/29/19	0.12	0.36	-	0.01	0.09	0.08	0.07	-	0.19	0.11	0.03	0.03	0.02	0.22	1.40	3.00	0.22	1.60	-	0.09
09/30/19	-	0.09	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-
Total	1.46	1.88	0.92P	1.35	1.30	1.77	1.95E	1.40	1.70	1.71	1.68	1.56	1.02	1.98	3.30		2.60	3.10		1.59

E – Erroneous data

M – Missing Data

P – Partial Missing data

T – Trace of rain/snow

X – Out of Service

³ 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 rd & 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
Crest&Hoff	Crestline & Hoffman
GEG	Spokane Airport
NWS	National Weather Service – Spokane
SFF	Spokane Felts Field