

CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
April 2018**

June 12, 2018
CSOMonthly2018-04.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				
3	Columbia @ Downriver	7	3	Total	14,435	45	
				04/07	8,734	30	
				04/10	4,444	10	
				04/29	1,257	5	
4	Nettleton @ York/Buckeye	10	None				
5	Nora @ Pettet	12	None				
6	Sherwood @ Summit	14	3	Total	8,354	70	
				04/07	3,993	45	
				04/10	3,566	15	
				04/29	795	10	
7	Nettleton @ Ohio	15	None				
8	A @ Linton	16B	None				
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	None				
11	Main @ Oak	22B	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
12	Cedar @ Ide	23	3	Total	27,218	135	Missing data 04/07 10:00 to 04/07 10:05 Missing data 04/11 09:00 to 04/11 09:05 Missing data 04/15 09:00 to 04/15 09:05 Missing data 04/19 08:00 to 04/19 08:05 Missing data 04/23 05:00 to 04/23 05:05 Missing data 04/26 23:00 to 04/26 23:05 Missing data 04/30 12:15 to 04/30 12:20 Missing data 04/30 17:00 to 04/30 17:05
				04/07	16,397	75	
				04/10	333	15	
				04/29	10,488	45	
13	Riverside @ Cedar (West)	24A	4	Total	1,640,150	740	Missing data 04/05 12:50 to 04/05 12:55
				04/05	310	15	
				04/07	973,074	160	
				04/10	537,262	420	
				04/29	129,504	145	
14	Riverside @ Cedar (East)	24B	1	Total	177	10	
				04/30	177	10	
15	Cedar @ Main	25	3	Total	102,793	200	
				04/07	36,671	75	
				04/10	28,227	70	
				04/29	37,895	55	
16	Riverside @ Lincoln	26	5	Total	8,927,437	1,550	Missing data 04/19 08:05 to 04/19 08:10
				04/05	137,454	105	
				04/07	1,563,240	150	
				04/10	4,871,616	980	
				04/28	256,578	75	
				04/29	2,098,549	240	
18	Perry @ 3rd	33B	2	Total	544,453	80	
				04/07	292,378	50	
				04/16	252,075	30	
19	Arthur @ 3rd	33C	2	Total	6,990	55	
				04/16	2,769	35	
				04/29	4,221	20	
20	Sprague Ave @ Sprague Wy	33-2	None				
21	Riverside @ Napa/Crestline	34	3	Total	214,729	360	
				04/07	106,101	105	
				04/15	73,792	160	
				04/29	34,836	95	
22	S. Riverton @ Magnolia	38	None				
23	Rebecca @ Upriver	41	None				

Line No.	Regulator Location	CSO No.	Freq.	Date of event ¹	Estimated Total Flow (Gallons) ²	Event Duration (Min. of Overflow)	Comments
24	Riverton @ Surro	42	None				
25	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
	Monthly Total		29		11,486,736	3,245	No Dry Weather Overflows No RPWRF CSO-Related Bypasses

Table 2 – Rainfall Summary³

	1004	343	344	Shadle	Hartson	CityHall	Joe_Albi	RkwdVsta	Station8	W_Drive	Nora&Pet	GEG			NWS			SFF
Date	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Snow	Dpth	Rain	Snow	Dpth	Rain
04/01/18	X	-	-	-	-	-	-	-	-	-	-	T	T	-	T	-	-	T
04/02/18	X	-	-	-	-	-	-	-	-	-	-	T	-	-	T	T	-	-
04/03/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/04/18	X	0.06	0.06	0.07	0.02	0.06	0.07	0.07	0.05	0.07	0.07	0.08	-	-	0.11	-	-	0.04
04/05/18	X	0.52	0.47	0.43	0.36	0.50	0.45	0.68	0.48	0.54	0.50	0.45	-	-	0.48	-	-	0.46
04/06/18	X	-	-	0.01	-	0.01	0.01	-	0.01	0.02	0.02	T	-	-	0.03	-	-	-
04/07/18	X	0.34	0.36	0.45	0.27	0.39	0.43	0.49	0.38	0.38	0.42	0.38	-	-	0.46	-	-	0.38
04/08/18	X	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	-	-	T	-	-	0.05	-	-	0.01
04/09/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/10/18	X	0.22	0.18	0.25	0.17	0.26	0.22	0.19	0.20	0.25	0.33	0.13	-	-	0.26	-	-	0.24
04/11/18	X	0.05	0.06	0.08	0.05	0.08	0.07	0.08	0.06	0.09	0.07	0.08	-	-	0.10	-	-	0.04
04/12/18	X	0.45	0.29	0.21	0.30	0.27	0.34	0.30	0.30	0.34	0.31	0.31	T	-	0.49	-	-	0.38
04/13/18	X	0.10	0.07	0.09	0.09	0.07	0.09	0.13	0.07	0.08	0.07	0.07	-	-	0.09	-	-	0.08
04/14/18	X	0.01	0.01	-	0.01	-	-	0.02	0.02	-	-	T	-	-	0.01	-	-	0.01
04/15/18	X	0.39	0.28	0.31	0.31	0.31	0.43	0.48	0.38	0.38	0.38	0.39	-	-	0.56	-	-	0.44
04/16/18	X	0.32	0.27	0.20	0.31	0.21	0.09	0.40	0.28	0.20	0.18	0.07	-	-	0.07	-	-	0.26
04/17/18	X	0.02	0.01	-	0.01	0.01	0.01	-	-	0.01	0.01	T	T	-	0.01	-	-	T
04/18/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/19/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/20/18	X	-	-	-	-	-	-	-	-	-	-	T	-	-	T	-	-	-
04/21/18	X	-	-	-	-	-	-	-	-	-	-	T	-	-	T	-	-	-
04/22/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/23/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/24/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/25/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/26/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/27/18	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/28/18	X	0.15	0.14	0.15	0.14	0.13	0.11	0.23	0.18	0.12	0.14	0.06	-	-	0.08	-	-	0.14
04/29/18	X	0.06	0.02	0.23	0.15	0.18	0.14	0.15	0.33	0.01	0.16	T	-	-	0.03	-	-	0.18
04/30/18	X	0.08	0.22	0.09	0.09	0.11	-	0.12	-	0.20	0.01	0.01	-	-	T	-	-	-
Total	0X	2.78	2.45	2.58	2.29	2.60	2.47	3.36E	2.75	2.69	2.67	2.03	T	-	2.83	T	-	2.66

- E - Erroneous data
- M - Missing data
- P - Partial missing data
- T - Trace of rain/snow
- X - Out of Service

Table 3 – Rain Gauges

1004	Airway Heights
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
GEG	Spokane Airport
NWS	National Weather Service – Spokane
SFF	Spokane Felts Field

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.