

CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
March 2015**

**April 13, 2015
Amended September 19, 2016**
CSOMonthly2015-03

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	2	Total	905,865	770	Missing data 03/11 14:25 to 03/11 14:30
				03/15	828,766	690	
				03/28	77,099	80	
3	Columbia @ Downriver	7	1	Total	35,126	165	Missing data 03/28 21:00 to 03/28 21:05
				03/15	35,126	165	
4	Nettleton @ York/Buckeye	10	None				Missing data 03/11 14:25 to 03/11 14:30
5	Nora @ Pettet	12	1	Total	34,878	30	Missing data 03/17 13:10 to 03/17 13:15 Missing data 03/17 13:20 to 03/17 13:25
				03/28	34,878	30	
6	Sherwood @ Summit	14	1	Total	2,614	40	
				03/15	2,614	40	
7	Nettleton @ Ohio	15	None				Missing data 03/16 10:00 to 03/16 10:15 Missing data 03/20 08:45 to 03/20 09:00
8	A @ Linton	16B	None				
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	None				
11	Main @ Oak	22B	None				
12	Cedar @ Ide	23	1	Total	129,310	250	
				03/15	129,310	250	
13	Riverside @ Cedar (West)	24A	2	Total	4,292,468	625	
				03/15	4,234,103	590	
				03/28	58,365	35	

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
14	Riverside @ Cedar (East)	24B	2	Total	792	370	Missing data 03/25 13:30 to 03/25 13:35
				03/15	385	175	
				03/28	407	195	
15	Cedar @ Main	25	2	Total	156,031	320	Missing data 03/11 13:00 to 03/11 14:00
				03/15	139,230	290	
				03/28	16,801	30	
16	Riverside @ Lincoln	26	2	Total	4,029,752	835	Missing data 03/10 08:10 to 03/10 09:10
				03/15	3,618,123	655	
				03/24	411,629	180	
17	Arthur @ 5th	33A	2	Total	6,877	90	Missing data 03/18 10:00 to 03/18 10:05 Missing Data 03/20 14:55 to 03/20 15:00
				03/15	6,329	80	
				03/28	548	10	
18	Perry @ 3rd	33B	1	Total	498,594	80	Missing data 03/11 15:10 to 03/11 15:15
				03/15	498,594	80	
19	Arthur @ 3rd	33C	1	Total	1,952	20	
				03/15	1,952	20	
20	Arthur @ 1st	33D	2	Total	12,434	175	Missing data 03/10 13:20 to 03/10 13:55 Missing data 03/11 12:50 to 03/11 13:50 Missing data 03/16 14:05 to 03/16 14:10
				03/15	12,334	165	
				03/24	100	10	
21	Riverside @ Napa/Crestline	34	2	Total	1,936,240	495	
				03/15	1,929,716	475	
				03/28	6,524	20	
22	S. Riverton @ Magnolia	38	None				Missing data 03/11 15:45 to 03/11 15:50 Missing data 03/24 11:05 to 03/24 11:10
23	Rebecca @ Upriver	41	2	Total	42,797	270	Missing data 03/14 00:00 to 03/14 00:05 Missing data 03/15 00:00 to 03/15 00:05
				03/15	42,474	255	
				03/28	323	15	
24	Riverton @ Surro	42	None				
25	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
Monthly Total			24		12,085,730	4,535	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
03/01/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00P	0.00	0.0	0	0.00	0.0	0	0.00
03/02/15	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.01	0.04	0.9	0	0.03	0.4	0	0.05
03/03/15	0.00	0.04	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.00	0.00	0.0	1	0.00	0.0	T	0.00
03/04/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/05/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/06/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/07/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/08/15	0.00P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/09/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00P	0.00	0.0	0	0.00	0.0	0	0.00
03/10/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/11/15	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	T	0.0	0	T	0.0	0	T
03/12/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/13/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	T	0.0	0	0.00
03/14/15	0.23	0.19	0.20	0.14	0.16	0.16	0.15	0.18	0.16	0.18	0.16	0.17	0.0	0	0.14	0.0	0	0.16
03/15/15	1.49	1.32	1.30	1.30	1.19	1.26	1.27	1.26	1.29	1.42	1.36	1.33	0.0	0	1.35	0.0	0	1.30
03/16/15	0.00P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.01
03/17/15	0.16	0.21	0.20	0.20	0.18	0.16	0.20	0.20	0.19	0.22	0.21P	0.19	0.0	0	0.18	0.0	0	0.24
03/18/15	0.01	0.03	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01P	T	0.0	0	0.00	0.0	0	T
03/19/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/20/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00P	T	0.0	0	0.00	0.0	0	0.00
03/21/15	0.06	0.04	0.04	0.01	0.03	0.02	0.01	0.03	0.03	0.01	0.02	0.01	0.0	0	0.02	0.0	0	0.04
03/22/15	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.0	0	T	0.0	0	T
03/23/15	0.13	0.17	0.11	0.11	0.21	0.11	0.05	0.13	0.14	0.15	0.08	0.07	0.0	0	0.07	0.0	0	0.15
03/24/15	0.13P	0.21	0.27	0.07	0.12	0.18	0.08	0.24	0.12	0.22	0.16	0.17	0.0	0	0.14	0.0	0	0.15
03/25/15	0.17	0.17	0.15	0.16	0.14	0.12	0.20	0.15	0.12	0.18	0.17	0.17	0.0	0	0.20	0.0	0	0.14
03/26/15	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.00	0.00	0.02	0.00	0.01	0.0	0	0.01	0.0	0	0.01
03/27/15	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.02	0.0	0	0.07	0.0	0	0.06
03/28/15	0.43	0.25	0.26	0.23	0.27	0.26	0.28	0.26	0.28	0.29	0.25	0.24	0.0	0	0.22	0.0	0	0.19
03/29/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/30/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
03/31/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	T	0.0	0	0.00	0.0	0	0.00
Total	2.82	2.68	2.57	2.25	2.33	2.28	2.32	2.49	2.36	2.75	2.46	2.43	0.9		2.43	0.4		2.50

- 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.