

# **CITY OF SPOKANE, WASHINGTON**

## **CSO FLOW MONITORING PROJECT**

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### **FLOW, FREQUENCY AND DURATION**

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#### **SEWER MAINTENANCE**

**Monthly Report  
April 2017**

**May 9, 2017**  
*CSOMonthly2017-04.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 <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				Missing data 04/03 21:10 to 04/03 21:15 Missing data 04/22 21:50 to 04/22 21:55 Missing data 04/24 17:45 to 04/24 17:50
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				
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	None				
11	Main @ Oak	22B	None				
12	Cedar @ Ide	23	None				Missing data 04/04 08:00 to 04/04 08:05
13	Riverside @ Cedar (West)	24A	4	<b>Total</b>	<b>436,414</b>	<b>295</b>	
				04/07	40,607	55	
				04/12	65,823	70	
				04/17	329,208	160	
				04/26	776	10	

<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
14	Riverside @ Cedar (East)	24B	1	<b>Total</b>	<b>357</b>	<b>15</b>	Missing data 04/10 22:05 to 04/10 22:20
				04/24	357	15	
15	Cedar @ Main	25	4	<b>Total</b>	<b>41,944</b>	<b>170</b>	
				04/07	4,314	15	
				04/12	4,189	25	
				04/17	20,050	95	
				04/24	13,391	35	
16	Riverside @ Lincoln	26	4	<b>Total</b>	<b>2,974,697</b>	<b>565</b>	
				04/07	391,457	100	
				04/10	549,866	170	
				04/17	1,633,646	235	
				04/24	399,728	60	
17	Arthur @ 5th	33A	2	<b>Total</b>	<b>1,249</b>	<b>20</b>	
				04/07	313	5	
				04/26	936	15	
18	Perry @ 3rd	33B	None				Missing data 04/17 12:10 to 04/17 12:25
19	Arthur @ 3rd	33C	1	<b>Total</b>	<b>806</b>	<b>15</b>	
				04/26	806	15	
20	Sprague Ave @ Sprague Wy	33-2	None				
21	Riverside @ Napa/Crestline	34	3	<b>Total</b>	<b>97,050</b>	<b>220</b>	
				04/07	18,670	50	
				04/12	4,266	35	
				04/17	74,114	135	
22	S. Riverton @ Magnolia	38	None				
23	Rebecca @ Upriver	41	4	<b>Total</b>	<b>19,554</b>	<b>185</b>	Missing data 04/12 12:55 to 04/12 13:00 Missing data 04/21 09:45 to 04/21 10:15 Missing data 04/21 10:30 to 04/21 10:40 Missing data 04/24 10:05 to 04/24 10:20
				04/07	1,064	25	
				04/12	355	20	
				04/17	7,290	80	
				04/24	10,845	60	
24	Riverton @ Surro	42	None				
25	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
	<b>Monthly Total</b>		<b>23</b>		<b>3,572,071</b>	<b>1,485</b>	<b>No Dry Weather Overflows No RPWRF CSO-Related Bypasses</b>

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

	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
04/01/17	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
04/02/17	-	-	-	-	-	X	-	-	-	-	-	T	-	-	T	T	-	-
04/03/17	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
04/04/17	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
04/05/17	0.05	0.10	0.08	0.12	0.06	X	0.11	0.15	0.06	0.10	0.12	0.08	-	-	0.08	-	-	0.09
04/06/17	0.05	0.06	0.05	0.07	0.05	X	0.06	0.08	0.05	0.06	0.06	0.05	-	-	0.05	-	-	0.07
04/07/17	0.28P	0.31	0.20	0.15	0.21	X	0.20	0.34	0.19	0.18	0.17	0.16	-	-	0.20	-	-	0.24
04/08/17	0.03	0.04	0.01	-	0.03	X	0.01	0.01	0.01	0.02	-	0.02	T	-	0.05	-	-	0.05
04/09/17	-	-	-	-	-	X	-	-	-	-	-	-	-	-	0.04	-	-	-
04/10/17	0.22	0.22	0.18	0.19	0.15	X	0.17	0.25	0.09	0.16	0.14	0.16	0.50	-	0.22	0.30	-	0.14
04/11/17	-	0.01	-	-	-	X	-	-	-	-	0.01	-	-	-	-	-	-	-
04/12/17	0.27	0.28	0.26	0.30	0.22	X	0.31	0.44	0.29	0.32	0.32	0.29	-	-	0.44	-	-	0.29
04/13/17	0.04	0.07	0.06	0.06	0.08	X	0.05	0.10	0.03	0.06	0.04	0.03	-	-	0.04	-	-	0.05
04/14/17	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
04/15/17	OP	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
04/16/17	-	-	-	-	-	X	-	-	-	-	-	T	-	-	T	-	-	-
04/17/17	0.47	0.49	0.47	0.52	0.46	X	0.51	0.72	0.52	0.52	0.47	0.51	-	-	0.49	-	-	0.55
04/18/17	0.12	0.09	0.11	0.06	0.09	X	0.06	0.14	0.07	0.11	0.10	0.09	-	-	0.09	-	-	0.07
04/19/17	-	-	0.01	-	-	X	-	-	0.01	-	-	T	-	-	T	-	-	0.01
04/20/17	0.03	0.04	0.02	0.03	0.04	X	0.04	0.01	0.01	0.02	0.04	0.02	-	-	0.04	-	-	0.02
04/21/17	-	-	0.01	-	-	X	-	-	-	-	0.01	-	-	-	-	-	-	T
04/22/17	-	-	-	-	-	X	-	-	-	-	-	T	-	-	T	-	-	T
04/23/17	OP	0.02	-	-	-	X	-	-	-	0.01	0.03	0.01	-	-	-	-	-	T
04/24/17	-	0.09	0.05	0.03	0.08	X	0.04	0.09	0.09	0.03	0.01	0.03	-	-	0.12	-	-	0.07
04/25/17	0.02	0.08	0.08	-	0.03	X	-	0.02	-	0.02	-	0.09	-	-	-	-	-	T
04/26/17	0.01	0.14	0.12	0.16	0.13	X	0.09	0.19	0.08	0.10	0.13	0.06	-	-	0.03	-	-	0.15
04/27/17	0.02	0.01	-	0.04	0.01	X	-	0.02	0.05	0.01	0.01	T	-	-	T	-	-	0.08
04/28/17	-	-	-	0.01	-	X	0.02	0.01	-	-	-	T	-	-	0.01	-	-	0.01
04/29/17	-	-	-	-	-	X	-	-	-	-	-	T	-	-	T	-	-	T
04/30/17	-	-	-	-	-	X	-	-	-	-	-	T	-	-	-	-	-	T
<b>Total</b>	<b>1.61</b>	<b>2.05</b>	<b>1.71</b>	<b>1.74</b>	<b>1.64</b>	<b>0X</b>	<b>1.67</b>	<b>2.57</b>	<b>1.55</b>	<b>1.72</b>	<b>1.66</b>	<b>1.60</b>	<b>0.50</b>		<b>1.90</b>	<b>0.30</b>		<b>1.89</b>

- 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 <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
GEG	Spokane Airport
NWS	National Weather Service – Spokane
SFF	Spokane Felts Field

<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.