

# **CITY OF SPOKANE, WASHINGTON**

## **CSO FLOW MONITORING PROJECT**

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

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#### **SEWER MAINTENANCE**

**Monthly Report  
May 2016**

**July 5, 2016**  
*CSOMonthly2016-05*

## 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				Missing data 05/01 10:00 to 05/01 10:05
2	NW Blvd @ Kiernan	6	1	Total	2,577,746	595	Missing data 05/23 08:20 to 05/23 08:25 Missing data 05/24 09:05 to 05/24 09:10
				05/21	2,577,746	595	
3	Columbia @ Downriver	7	1	Total	78,604	25	
				05/21	78,604	25	
4	Nettleton @ York/Buckeye	10	None				Missing data 05/24 10:05 to 05/24 10:10
5	Nora @ Pettet	12	2	Total	234,215	290	
				05/04	21,416	25	
				05/21	212,799	265	
6	Sherwood @ Summit	14	None				Missing data 05/31 08:05 to 05/31 08:10
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				Missing data 05/06 09:10 to 05/06 09:15 Missing data 05/24 09:25 to 05/24 09:30
12	Cedar @ Ide	23	None				Missing data 05/25 14:25 to 05/25 14:30
13	Riverside @ Cedar (West)	24A	1	Total	1,441,962	230	
				05/21	1,441,962	230	
14	Riverside @ Cedar (East)	24B	None				
15	Cedar @ Main	25	2	Total	21,638	135	
				05/04	1,615	10	
				05/21	20,023	125	

<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
<b>16</b>	<b>Riverside @ Lincoln</b>	<b>26</b>	<b>2</b>	<b>Total</b>	<b>2,550,632</b>	<b>460</b>	
				05/04	156,294	30	
				05/21	2,394,338	430	
<b>17</b>	<b>Arthur @ 5th</b>	<b>33A</b>	<b>1</b>	<b>Total</b>	<b>9,427</b>	<b>55</b>	<b>Missing data 05/16 10:30 to 05/16 10:35</b>
				05/21	9,427	55	
<b>18</b>	<b>Perry @ 3rd</b>	<b>33B</b>	<b>1</b>	<b>Total</b>	<b>1,484,580</b>	<b>180</b>	
				05/21	1,484,580	180	Estimated from redundant instrument
<b>19</b>	<b>Arthur @ 3rd</b>	<b>33C</b>	<b>2</b>	<b>Total</b>	<b>35,537</b>	<b>135</b>	<b>Missing data 05/10 10:05 to 05/10 10:10</b>
							<b>Missing data 05/11 08:55 to 05/11 09:35</b>
							<b>Missing data 05/11 13:35 to 05/11 13:40</b>
				05/04	825	10	
				05/21	34,712	125	
<b>20</b>	<b>Arthur @ 1st</b>	<b>33D</b>	<b>None</b>				
<b>21</b>	<b>Riverside @ Napa/Crestline</b>	<b>34</b>	<b>1</b>	<b>Total</b>	<b>2,023,833</b>	<b>395</b>	
				05/21	2,023,833	395	
<b>22</b>	<b>S. Riverton @ Magnolia</b>	<b>38</b>	<b>None</b>				
<b>23</b>	<b>Rebecca @ Upriver</b>	<b>41</b>	<b>1</b>	<b>Total</b>	<b>85,724</b>	<b>285</b>	
				05/21	85,724	285	
<b>24</b>	<b>Riverton @ Surro</b>	<b>42</b>	<b>None</b>				
<b>25</b>	<b>RPWRF CSO-Related Bypass</b>	<b>N/A</b>	<b>None</b>				<b>Permit Section S13.H</b>
	<b>Monthly Total</b>		<b>15</b>		<b>10,543,898</b>	<b>2,785</b>	<b>No Dry Weather Overflows</b> <b>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	
05/01/16	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
05/02/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	
05/03/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	
05/04/16	0.23	0.01	0.01	0.05	0.01	0.06	0.10	0.02	0.01	0.06	0.20	0.09	-	-	0.18	-	-	M	0.16
05/05/16	0.05P	0.10	0.08	0.06	0.09	0.07	0.05	0.12	0.10	0.07	OP	-	-	-	T	-	-	M	-
05/06/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M
05/07/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M
05/08/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	M	M	M	-
05/09/16	0.33	0.09	0.09	0.08	0.05	0.09	0.23	0.16	0.05	0.07	0.05	0.18	-	-	0.04	-	-	-	0.06
05/10/16	-	-	-	-	-	-	-	-	-	-	0.01	T	-	-	T	-	-	-	-
05/11/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/12/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/13/16	OP	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-
05/14/16	0.02	-	-	-	-	-	-	-	-	0.01	-	T	-	-	0.01	-	-	-	T
05/15/16	0.10	0.03	0.04	0.03	0.02	0.06	0.04	0.06	0.04	0.04	0.07	0.07	-	-	0.06	-	-	-	0.05
05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/17/16	-	-	-	-	-	-	-	-	-	-	OP	-	-	-	-	-	-	-	-
05/18/16	0.03	0.06	0.04	0.02	0.02	0.04	0.01	0.04	0.04	0.04	0.02	0.03	-	-	0.03	-	-	M	0.04
05/19/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M
05/20/16	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	T	-	-	M	0.01
05/21/16	0.10	0.96	0.54	1.43	1.12	0.49	1.13	1.37	0.84	0.36	0.59	0.09	-	-	0.37	-	-	M	0.54
05/22/16	0.32	0.33	0.29	0.50	0.52	0.42	0.57	0.43	0.66	0.31	0.52	0.21	-	-	0.29	-	-	M	0.62
05/23/16	0.04	0.13	0.08	0.10	0.11	0.08	0.12	0.10	0.10	0.10	0.10	0.05	-	-	0.08	-	-	-	0.11
05/24/16	0.03	0.02	0.01	0.01	0.02	0.01	0.01	0.03	0.01	0.01	0.01	0.05	-	-	0.01	-	-	-	0.01
05/25/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/26/16	OP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/27/16	-	0.05	0.01	0.03	0.02	0.02	-	0.05	0.02	-	0.01	T	-	-	T	-	-	-	0.04
05/28/16	-	-	-	-	-	-	-	-	-	-	OP	-	-	-	-	-	-	-	-
05/29/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/30/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/31/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.25	1.78	1.20	2.31	1.98	1.34	2.26	2.39	1.87	1.07	1.58	0.78	0.0		1.07	0.0			1.64

- 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.