

# **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 2015**

May 12, 2015  
*CSOMonthly2015-04*

## 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	3	<b>Total</b>	<b>35,109</b>	<b>85</b>	
				04/01	16,490	25	
				04/06	1,382	20	
				04/14	17,237	40	
3	Columbia @ Downriver	7	None				Missing data 04/05 16:00 to 04/05 16:05 Missing data 04/09 13:00 to 04/09 13:05
4	Nettleton @ York/Buckeye	10	None				
5	Nora @ Pettet	12	1	<b>Total</b>	<b>2,782</b>	<b>10</b>	
				04/01	2,782	10	
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				
13	Riverside @ Cedar (West)	24A	None				
14	Riverside @ Cedar (East)	24B	1	<b>Total</b>	<b>207</b>	<b>250</b>	
				04/01	207	250	
15	Cedar @ Main	25	2	<b>Total</b>	<b>9,584</b>	<b>50</b>	
				04/01	8,506	40	
				04/14	1,078	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.

April 2015

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>146,804</b>	<b>100</b>	
				04/01	58,800	40	
				04/14	88,004	60	
<b>17</b>	<b>Arthur @ 5th</b>	<b>33A</b>	<b>1</b>	<b>Total</b>	<b>2,295</b>	<b>15</b>	
				04/09	2,295	15	
<b>18</b>	<b>Perry @ 3rd</b>	<b>33B</b>	<b>None</b>				
<b>19</b>	<b>Arthur @ 3rd</b>	<b>33C</b>	<b>1</b>	<b>Total</b>	<b>1,469</b>	<b>15</b>	
				04/09	1,469	15	
<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>125,093</b>	<b>80</b>	
				04/14	125,093	80	
<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>352</b>	<b>15</b>	<b>Missing data 04/06 13:15 to 04/06 13:35</b>
				04/14	352	15	
<b>24</b>	<b>Riverton @ Surro</b>	<b>42</b>	<b>None</b>				<b>Missing data 04/24 14:50 to 04/24 14:55</b> <b>Missing data 04/27 09:35 to 04/27 09:40</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>13</b>		<b>323,695</b>	<b>620</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
04/01/15	0.02P	0.20	0.05	0.10	0.13	0.19	0.12	0.19	0.10	0.14	0.20P	0.02	T	0	0.02	T	0	0.11
04/02/15	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	T	T	0	T	T	0	0.00
04/03/15	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
04/04/15	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
04/05/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.0	0	0.01	0.0	0	0.05
04/06/15	0.32	0.48	0.36	0.28	0.32	0.26	0.35	0.34	0.31	0.36	0.34	0.30	1.0	0	0.45	1.3	0	0.32
04/07/15	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
04/08/15	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
04/09/15	0.00	0.02	0.04	0.02	0.06	0.01	0.10	0.19	0.00	0.04	0.04	0.03	0.0	0	0.02	0.0	0	T
04/10/15	0.00P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.0	0	0.00	0.0	0	0.00
04/11/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.0	0	T	0.0	0	T
04/12/15	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
04/13/15	0.04	0.16	0.09	0.08	0.12	0.06	0.07	0.09	0.12	0.08	0.07	0.08	0.0	0	0.12	0.0	0	0.31
04/14/15	0.14	0.26	0.21	0.14	0.26	0.19	0.16	0.24	0.21	0.16	0.23	0.08	T	0	0.04	T	0	0.09
04/15/15	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
04/16/15	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
04/17/15	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
04/18/15	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
04/19/15	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
04/20/15	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
04/21/15	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
04/22/15	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
04/23/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.0	0	0.01	0.0	0	T
04/24/15	0.02	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	T	0.0	0	T	0.0	0	T
04/25/15	0.00	0.11	0.08	0.03	0.07	0.02	0.03	0.04	0.04	0.02	0.06	0.01	0.0	0	0.14	0.0	0	0.04
04/26/15	0.00	0.00	0.02	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
04/27/15	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
04/28/15	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	M	0.00
04/29/15	0.04	0.02	0.02	0.02	0.01	0.03	0.01	0.02	0.02	0.02	0.02	0.01	0.0	0	0.01	0.0	M	0.03
04/30/15	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	M	0.00
<b>Total</b>	<b>0.58</b>	<b>1.25</b>	<b>0.87</b>	<b>0.69</b>	<b>0.97</b>	<b>0.76</b>	<b>0.87</b>	<b>1.11</b>	<b>0.80</b>	<b>0.82</b>	<b>0.97</b>	<b>0.53</b>	<b>1.0</b>		<b>0.82</b>	<b>1.3</b>		<b>0.95</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.