

# **CITY OF SPOKANE, WASHINGTON**

## **CSO FLOW MONITORING PROJECT**

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# **FLOW, FREQUENCY AND DURATION**

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## **SEWER MAINTENANCE**

**Monthly Report  
September 2007**

November 5, 2007  
(Revised: December 10, 2007)  
*CSOMonthly2007-09revised.doc*

## 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. See Attachment A for a summary of the precipitation volumes.

**Table 1 – Flow-Frequency-Duration**

	Location	CSO#	Freq.	Date of Event <sup>1</sup>	Estimated <sup>2</sup> Total Flow (Gallons)	Event Duration (Minutes)	Comments
1.	AL Parkway Storage (West)	2	None				
2.	NW Blvd @ Kiernan	6	1	Total	109,798	145	Missing data 9/10 09:15 to 9/10 09:25
				9/30	109,798	145	
3.	Columbia @ Downriver	7	None				
4.	Nettleton @ York/Buckeye	10	None				Missing data 9/10 09:35 to 9/10 09:40
5.	Nora @ Pettet	12	2	Total	42,426	215	
				9/23	538	25	
				9/30	41,888	190	
6.	Sherwood @ Summit	14	None				
7.	Nettleton @ Ohio	15	1	Total	202	95	
				9/30	202	95	
8.	A @ Linton	16B	None				
9.	7 <sup>th</sup> @ Inland Empire	19	None				Missing data 9/4 08:40 to 9/4 08:45
10.	3500 High Drive	20	None				Missing data 9/4 09:10 to 9/4 09:20
11.	Main @ Oak	22B	None				Missing data 9/10 13:30 to 9/10 13:35

<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.

	Location	CSO#	Freq.	Date of Event <sup>1</sup>	Estimated <sup>2</sup> Total Flow (Gallons)	Event Duration (Minutes)	Comments
12.	Cedar @ Ide	23	1	Total	5,170	1,755	Missing data 9/24 02:15 to 9/24 06:20
				9/30	5,170	1,755	
13.	Riverside @ Cedar	24A	None				Missing data 9/10 11:00 to 9/10 11:05
14.	Riverside @ Cedar	24B	None				Missing data 9/10 10:55 to 9/10 11:00
15.	Cedar @ Main	25	None				Missing data 9/10 13:25 to 9/10 13:30
16.	Riverside @ Lincoln	26	None				Missing data 9/10 13:05 to 9/10 13:10 Missing data 9/25 13:05 to 9/25 15:00
17.	Arthur @ 5 <sup>th</sup>	33A	None				
18.	Perry @ 3 <sup>rd</sup>	33B	None				Missing data 9/4 12:00 to 9/4 12:05
19.	Arthur @ 3 <sup>rd</sup>	33C	None				
20.	Arthur @ 1 <sup>st</sup>	33D	1	Total	19,339	185	Missing data 9/4 12:35 to 9/4 12:40 Missing data 9/6 12:45 to 9/6 13:00
				9/30	19,339	185	
21.	Riverside @ Napa/Crestline	34	None				Missing data 9/4 11:50 to 9/4 11:55 Missing data 9/6 13:10 to 9/6 14:50
22.	S. Riverton @ Magnolia	38	None				Missing data 9/4 11:30 to 9/4 11:40
23.	S. Riverton @ Altamont	39	None				
24.	S. Riverton @ Regal	40	None				Missing data 9/4 11:20 to 9/4 11:25
25.	Rebecca @ Upriver	41	None				Missing data 9/13 12:20 to 9/13 12:55 Missing data 9/18 09:55 to 9/18 10:45 Missing data 9/24 01:40 to 9/24 01:55
26.	Riverton @ Surro	42	None				Missing data 9/4 10:55 to 9/4 11:00
	<b>Monthly Total</b>		<b>6</b>		<b>176,935</b>	<b>2,395</b>	<b>No Dry Weather Overflows</b>

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

Date	1004 Rain	343 Rain	344 Rain	Shadle Rain	Hartson Rain	CityHall Rain	Joe_Albi Rain	RkwdVsta Rain	Station8 Rain	W_Drive Rain	Nora&Pet Rain	GEG Rain	Snow	Dpth	NWS Rain	Snow	Dpth
09/01/07	0	0	0	0	0.04	0	0	0	0	0	0	0	0	0	0	0	0
09/02/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/03/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/04/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/05/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/06/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/07/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/08/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/09/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/10/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/11/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/12/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/13/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/14/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/15/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/16/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
09/17/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/18/07	0	0.02	0.01	0	0	0	0	0	0	0	0	T	0	0	0.01	0	0
09/19/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/20/07	0.02	0.01	0.01	0.01	0.02	0.03	0.01	0.02	0.01	0.02	0.02	0.01	0	0	0.05	0	0
09/21/07	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0
09/22/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/23/07	0	0	0	0.01	0	0.08	0.01	0.02	0	0.01	0.02	T	0	0	0	0	0
09/24/07	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0
09/25/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/26/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/27/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/28/07	0.06	0.1	0.03	0.06	0.1	0.05	0.08	0.05	0.09	0.09	0.08	0.09	0	0	0.16	0	0
09/29/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/30/07	0.28	0.2	0.13	0.29	0.2	0.23	0.32	0.23	0.32	0.33	0.25	0.27	0	0	0.41	0	0
<b>Total</b>	<b>0.36</b>	<b>0.33</b>	<b>0.18</b>	<b>0.38</b>	<b>0.36</b>	<b>0.39</b>	<b>0.42</b>	<b>0.32</b>	<b>0.42</b>	<b>0.45</b>	<b>0.38</b>	<b>0.37</b>	<b>0.0</b>		<b>0.63</b>	<b>0.0</b>	

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

**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

<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.