

**CITY OF SPOKANE,  
WASHINGTON**

**CSO FLOW MONITORING PROJECT**

---

**FLOW, FREQUENCY AND DURATION**

---

**SEWER MAINTENANCE**

**Monthly Report  
June 2008**

August 12, 2008  
*CSOMonthly2008-06.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	3	Total	638,831	445	
				6/2	116	75	
				6/9	606,274	255	
				6/21	32,441	115	
3.	Columbia @ Downriver	7	2	Total	18,122	255	Missing data 6/3 08:25 to 6/3 08:30
				6/9	17,804	210	
				6/21	318	45	
4.	Nettleton @ York/Buckeye	10	1	Total	6,941	125	Missing data 6/3 08:55 to 6/3 09:00
				6/11	6,941	125	
5.	Nora @ Pettet	12	2	Total	275,613	290	Missing data 6/3 09:20 to 6/3 09:25
				6/9	262,063	210	
				6/21	13,550	80	
6.	Sherwood @ Summit	14	2	Total	4,089	405	Missing data 6/3 09:30 to 6/3 09:35
				6/9	3,625	280	
				6/21	464	125	
7.	Nettleton @ Ohio	15	1	Total	26,145	140	Missing data 6/3 09:40 to 6/3 09:45
				6/11	26,145	140	
8.	A @ Linton	16B	None				
9.	7 <sup>th</sup> @ Inland Empire	19	None				Missing data 6/10 08:25 to 6/10 08:30

<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
10.	3500 High Drive	20	None				Missing data 6/10 08:40 to 6/10 08:45
11.	Main @ Oak	22B	None				
12.	Cedar @ Ide	23	2	Total	161,144	175	Missing data 6/3 10:00 to 6/3 10:05
				6/11	153,526	140	
				6/21	7,618	35	
13.	Riverside @ Cedar	24A	2	Total	2,107,070	315	Missing data 6/3 11:00 to 6/3 11:05
				6/11	2,020,623	215	
				6/21	86,447	100	
14.	Riverside @ Cedar	24B	2	Total	2,983	70	
				6/11	2,691	60	
				6/21	292	10	
15.	Cedar @ Main	25	2	Total	54,567	260	Missing data 6/3 10:45 to 6/3 10:50
				6/9	45,544	165	
				6/21	9,023	95	
16.	Riverside @ Lincoln	26	3	Total	2,784,511	325	Missing data 6/3 13:00 to 6/3 13:05
				6/3	15,329	20	
				6/9	2,469,428	200	
				6/21	299,754	105	
17.	Arthur @ 5 <sup>th</sup>	33A	2	Total	8,420	155	Missing data 6/9 14:30 to 6/9 14:35
				6/11	7,582	140	
				6/21	838	15	
18.	Perry @ 3 <sup>rd</sup>	33B	2	Total	2,750,060	150	
				6/11	2,578,091	135	
				6/21	171,969	15	
19.	Arthur @ 3 <sup>rd</sup>	33C	2	Total	4,854	140	
				6/10	4,144	130	
				6/21	710	10	
20.	Arthur @ 1 <sup>st</sup>	33D	2	Total	56,327	185	Missing data 6/9 14:45 to 6/9 14:50
				6/9	49,324	150	
				6/21	7,003	35	
21.	Riverside @ Napa/Crestline	34	2	Total	2,910,056	280	Missing data 6/9 14:05 to 6/9 14:10
				6/9	2,830,294	225	
				6/21	79,762	55	

	Location	CSO#	Freq.	Date of Event <sup>1</sup>	Estimated <sup>2</sup> Total Flow (Gallons)	Event Duration (Minutes)	Comments
22.	S. Riverton @ Magnolia	38	1	Total	6,946	165	Missing data 6/9 11:50 to 6/9 11:55 Missing data 6/10 13:45 to 6/10 15:40 Missing data 6/11 09:55 to 6/11 10:50 Missing data 6/27 13:05 to 6/27 13:40
				6/11	6,946	165	
23.	S. Riverton @ Altamont	39	1	Total	11,230	140	Missing data 6/9 11:45 to 6/9 11:50
				6/11	11,230	140	
24.	S. Riverton @ Regal	40	1	Total	23,751	115	Missing data 6/9 11:35 to 6/9 11:40
				6/11	23,751	115	
25.	Rebecca @ Upriver	41	2	Total	141,058	225	
				6/11	135,771	200	
				6/21	5,287	25	
26.	Riverton @ Surro	42	1	Total	1,023	70	Missing data 6/9 11:10 to 6/9 11:15
				6/10	1,023	70	
	<b>Monthly Total</b>		<b>38</b>		<b>11,993,741</b>	<b>4,430</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
06/01/08	0.1	0.08	0.1	0.12	0.11	0.1	0.13	0.09	0.15	0.14	0.06	0.09	0	0	0.1	0	0
06/02/08	0.03	0	0.01	0.01	0	0	0	0	0	0	0	0.03	0	0	T	0	0
06/03/08	0.12	0.19	0.14	0	0.17	0.18	0.11	0.16	0.25	0.27	0.01P	0.2	0	0	0.22	0	0
06/04/08	0	0	0	0E	0	0	0	0	0	0	0	T	0	0	T	0	0
06/05/08	0.03	0.01	0	0	0.02	0.01	0.01	0.01	0.02	0.02	0	0.01	0	0	T	0	0
06/06/08	0.03	0.1	0.05	0	0.06	0.01	0.03	0.04	0.1	0.01	0	0.03	0	0	0.02	0	0
06/07/08	0.13	0.22	0.07	0.09	0.24	0.17	0.17	0.13	0.41	0.17	0.03	0.14	0	0	0.17	0	0
06/08/08	0	0	0	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0
06/09/08	0.17	0.19	0.06	0.21	0.16	0.1	0.3	0.07	0.09	0.11	0.01	0.07	0	0	0.26	0	0
06/10/08	0.04	0.07	0.02	0.06	0.05	0.01	0.01	0.03	0.04	0.02	0	0.05	T	0	0.02	T	0
06/11/08	0.16	0.74	0.28	0.25	0.64	0.55	0.39	0.5	1	0.38	0	0.14	0	0	0.21	0	0
06/12/08	0.01	0	0	0.05	0	0	0	0	0	0	0.65	0	0	0	0	0	0
06/13/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/14/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/15/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/16/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/17/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/18/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/19/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/20/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/21/08	0.19	0.16	0.16	0.19	0.16	0.13	0.16	0.11	0.25	0.17	0.13	0.24	0	0	0.36	0	0
06/22/08	0.05	0.08	0.06	0.11	0.08	0.05	0.08	0.07	0.1	0.06	0.08	0	0	0	0.01	0	0
06/23/08	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
06/24/08	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
06/25/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/26/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/27/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/28/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/29/08	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0
06/30/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1.06</b>	<b>1.84</b>	<b>0.95</b>	<b>1.09</b>	<b>1.69</b>	<b>1.31</b>	<b>1.39</b>	<b>1.21</b>	<b>2.42</b>	<b>1.35</b>	<b>0.99</b>	<b>1.00</b>	<b>0.0</b>		<b>1.37</b>	<b>0.0</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

<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.