

**CITY OF SPOKANE,
WASHINGTON**

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
June 2007**

August 9, 2007
CSOMonthly2007-06.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 ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
1.	AL Parkway Storage (West)	2	None				Missing data 6/4 14:05 to 6/4 14:40 Missing data 6/6 14:00 to 6/6 14:05
2.	NW Blvd @ Kiernan	6	2	Total	271,951	160	Missing data 6/5 06:45 to 6/5 06:55 Missing data 6/7 13:30 to 6/7 14:25
				6/5	256,329	105	
				6/29	15,622	55	
3.	Columbia @ Downriver	7	2	Total	43,448	155	Missing data 6/5 06:35 to 6/5 06:45 Missing data 6/11 13:00 to 6/11 13:35
				6/5	42,227	115	
				6/29	1,221	40	
4.	Nettleton @ York/Buckeye	10	2	Total	51,221	105	Missing data 6/5 07:10 to 6/5 07:15 Missing data 6/6 02:05 to 6/6 10:20
				6/5	51,081	80	
				6/29	140	25	
5.	Nora @ Pettet	12	2	Total	262,652	200	Missing data 6/5 07:30 to 6/5 07:35 Missing data 6/6 10:35 to 6/6 11:10
				6/5	232,031	135	
				6/29	30,621	65	
6.	Sherwood @ Summit	14	2	Total	2,843	225	Missing data 6/5 07:45 to 6/5 07:50 Missing data 6/11 14:10 to 6/11 14:30
				6/5	2,592	195	
				6/29	251	30	

¹ 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.

² 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 ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
7.	Nettleton @ Ohio	15	1	Total	34,710	110	Missing data 6/5 07:45 to 6/5 08:00 Missing data 6/13 08:45 to 6/13 09:05 Missing data 6/20 13:05 to 6/20 15:05 Missing data 6/21 09:00 to 6/21 09:50
				6/5	34,710	110	
8.	A @ Linton	16B	2	Total	151,582	175	
				6/5	150,000	145	Estimated due to erroneous readings from construction of storage tank at site.
				6/29	1,582	30	
9.	7 th @ Inland Empire	19	None				Missing data 6/12 08:35 to 6/12 09:50 Missing data 6/27 09:30 to 6/27 11:25 Missing data 6/29 08:30 to 6/29 08:55
10.	3500 High Drive	20	None				Missing data 6/12 09:15 to 6/12 09:25
11.	Main @ Oak	22B	None				Missing data 6/5 09:10 to 6/5 09:15
12.	Cedar @ Ide	23	2	Total	130,156	155	Missing data 6/5 08:25 to 6/5 08:30
				6/5	102,191	115	
				6/29	27,965	40	
13.	Riverside @ Cedar	24A	2	Total	93,883	165	Missing data 6/5 09:50 to 6/5 10:00
				6/5	59,396	110	
				6/29	34,487	55	
14.	Riverside @ Cedar	24B	2	Total	1,814	40	Missing data 6/5 09:55 to 6/5 10:00
				6/5	1,618	25	
				6/29	196	15	
15.	Cedar @ Main	25	3	Total	37,621	415	Missing data 6/5 09:00 to 6/5 09:05
				6/4	238	245	Dry weather overflow; DOE letter sent 8/3/07
				6/5	25,120	115	
				6/29	12,263	55	
16.	Riverside @ Lincoln	26	2	Total	718,309	150	Missing data 6/6 09:40 to 6/6 09:45
				6/5	378,707	100	
				6/29	339,602	50	
17.	Arthur @ 5 th	33A	None				Missing data 6/12 15:00 to 6/12 15:05
18.	Perry @ 3 rd	33B	None				Missing data 6/12 15:15 to 6/12 15:20
19.	Arthur @ 3 rd	33C	None				Missing data 6/12 15:20 to 6/12 15:25

	Location	CSO#	Freq.	Date of Event ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
20.	Arthur @ 1 st	33D	2	Total	12,098	85	Missing data 6/28 10:25 to 6/28 11:25
				6/5	5,220	45	
				6/29	6,878	40	
21.	Riverside @ Napa/Crestline	34	1	Total	1,504	15	Missing data 6/12 14:05 to 6/12 14:10 Missing data 6/19 10:00 to 6/19 15:35
				6/29	1,504	15	
22.	S. Riverton @ Magnolia	38	None				Missing data 6/12 13:20 to 6/12 13:30
23.	S. Riverton @ Altamont	39	None				Missing data 6/12 13:30 to 6/12 13:35
24.	S. Riverton @ Regal	40	None				Missing data 6/12 13:40 to 6/12 13:45 Missing data 6/14 09:45 to 6/14 10:20
25.	Rebecca @ Upriver	41	1	Total	198	55	Missing data 6/12 13:50 to 6/12 13:55
				6/5	198	55	
26.	Riverton @ Surro	42	None				Missing data 6/12 11:10 to 6/12 11:20
	Monthly Total		28		1,813,990	2,210	1 Dry Weather Overflows

Table 2 – Rainfall Summary³

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
06/01/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/02/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/03/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/04/07	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0.03	0	0
06/05/07	0.49	0.17	0.14	0	0.16	0.26	0.69	0.16	0.21	1.19	0.39P	0.34	0	0	0.68	0	0
06/06/07	0	0	0.01	0	0	0.01	0	0	0	0.03	0.02P	T	0	0	T	0	0
06/07/07	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
06/08/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/09/07	0.02	0.02	0.02	0	0.02	0.02	0.02	0.02	0.01	0.06	0.01	0.05	0	0	0.02	0	0
06/10/07	0.05	0.09	0.06	0	0.06	0.05	0.02	0.06	0.08	0.09	0.05	0.05	0	0	0.01	0	0
06/11/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/12/07	0	0	OP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/13/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/14/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/15/07	0	0	OM	0	0	0	0	0	0	0	0	T	0	0	T	0	0
06/16/07	0.01	0	OM	0	0	0	0	0	0	0	0	T	0	0	T	0	0
06/17/07	0.01	0.02	OM	0	0.04	0.01	0.02	0.01	0.01	0.03	0.01	0.01	0	0	0.08	0	0
06/18/07	0.01	0	OP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/19/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/20/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/21/07	0	0	0	0.22E	0	0	0	0	0	0	0	0	0	0	0	0	M
06/22/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/23/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/24/07	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0
06/25/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/26/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/27/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/28/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/29/07	0.19	0.12	0.41	0.78E	0.14	0.16	0.19	0.14	0.19	0.27	0.16	0.14	0	0	0.15	0	0
06/30/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.78	0.42	0.64	1	0.42	0.51	0.94	0.39	0.5	1.67	0.64	0.59	0.0		0.97	0.0	

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

Table 3 – Rain Gauges

1004	Airway Heights
343	23 rd & 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

³ 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.