

**CITY OF SPOKANE,
WASHINGTON**

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
May 2008**

July 11, 2008
CSOMonthly2008-05.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 5/6 09:00 to 5/6 09:05
2.	NW Blvd @ Kiernan	6	1	Total	44,780	210	Missing data 5/5 09:10 to 5/5 09:15
				5/20	44,780	210	
3.	Columbia @ Downriver	7	2	Total	940	105	Missing data 5/5 09:05 to 5/5 09:10 Missing data 5/19 08:30 to 5/19 08:35
				5/20	184	70	
				5/31	756	35	
4.	Nettleton @ York/Buckeye	10	None				Missing data 5/19 09:00 to 5/19 09:05
5.	Nora @ Pettet	12	2	Total	60,012	385	
				5/20	28,419	235	
				5/31	31,593	150	
6.	Sherwood @ Summit	14	2	Total	2,522	120	Missing data 5/5 10:00 to 5/5 10:05 Missing data 5/19 10:45 to 5/19 10:50
				5/20	614	55	
				5/31	1,908	65	
7.	Nettleton @ Ohio	15	2	Total	42,503	80	
				5/20	394	15	
				5/31	42,109	65	
8.	A @ Linton	16B	None				
9.	7 th @ Inland Empire	19	None				Missing data 5/12 09:15 to 5/12 09:20

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
10.	3500 High Drive	20	None				Missing data 5/12 09:30 to 5/12 09:35
11.	Main @ Oak	22B	None				Missing data 5/5 13:35 to 5/5 13:45 Missing data 5/19 12:55 to 5/19 13:00
12.	Cedar @ Ide	23	2	Total	33,806	130	Missing data 5/19 10:25 to 5/19 10:30
				5/20	25,624	110	
				5/31	8,182	20	
13.	Riverside @ Cedar	24A	1	Total	76,270	145	Missing data 5/5 14:35 to 5/5 14:40
				5/20	76,270	145	
14.	Riverside @ Cedar	24B	1	Total	732	10	Missing data 5/6 13:35 to 5/6 14:10 Missing data 5/8 10:35 to 5/8 11:05
				5/20	732	10	
15.	Cedar @ Main	25	3	Total	18,281	430	Missing data 5/19 12:50 to 5/19 12:55
				5/12	231	145	
				5/20	13,783	175	
				5/31	4,267	110	
16.	Riverside @ Lincoln	26	1	Total	816,552	245	Missing data 5/5 10:45 to 5/5 10:50 Missing data 5/19 12:40 to 5/19 12:45
				5/20	816,552	245	
17.	Arthur @ 5 th	33A	None				Missing data 5/13 10:40 to 5/13 10:45 Missing data 5/30 14:10 to 5/30 14:15
18.	Perry @ 3 rd	33B	None				Missing data 5/8 09:00 to 5/8 09:55 Missing data 5/13 10:15 to 5/13 10:20
19.	Arthur @ 3 rd	33C	None				Missing data 5/13 10:25 to 5/13 10:30
20.	Arthur @ 1 st	33D	1	Total	9,016	130	Missing data 5/13 10:55 to 5/13 11:00
				5/20	9,016	130	
21.	Riverside @ Napa/Crestline	34	2	Total	103,664	85	Missing data 5/13 10:05 to 5/13 10:10
				5/20	53,864	55	
				5/31	49,800	30	
22.	S. Riverton @ Magnolia	38	1	Total	234	40	Missing data 5/13 09:55 to 5/13 10:00 Missing data 5/22 01:15 to 5/22 01:30
				5/20	234	40	Regulator is below river level; Outfall was plugged to prevent inflow due to high river levels.
23.	S. Riverton @ Altamont	39	None				Missing data 5/13 09:45 to 5/13 09:50

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	Location	CSO#	Freq.	Date of Event ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
24.	S. Riverton @ Regal	40	None				Missing data 5/13 09:40 to 5/13 09:45
25.	Rebecca @ Upriver	41	2	Total	6,713	55	Missing data 5/13 09:30 to 5/13 09:35
				5/20	2,024	25	
				5/31	4,689	30	
26.	Riverton @ Surro	42	None				Missing data 5/13 09:15 to 5/13 09:20
	Monthly Total		23		1,216,025	2,170	No 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
05/01/08	0.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/02/08	0	0	0	0.01E	0	0	0	0	0	0	0	0	0	0	0	0	0
05/03/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/04/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/05/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/06/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
05/07/08	0.04	0.04	0.01	0	0.05	0.04	0.04	0.04	0.08	0.03	0.05	0.05	0	0	0.01	0	0
05/08/08	0.02	0	0	0.01E	0.01	0	0.01	0	0.01	0	0.04	T	0	0	0.05	T	0
05/09/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/10/08	0.05	0.09	0.03	0	0.04	0.03	0.02	0.04	0.06	0.03	0.03	0.04	0	0	0.02	0	0
05/11/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
05/12/08	0.01	0.02	0	0	0	0	0	0.01	0.02	0	0.01	0.01	0	0	0.01	0	0
05/13/08	0.02	0.01	0.01	0P	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.03	0	0	0.04	0	0
05/14/08	0.04	0.05	0.02	0M	0.04	0.03	0.04	0.03	0.04	0.08	0.03	0.04	0	0	0.04	0	0
05/15/08	0	0	0	0M	0	0	0	0	0	0	0	0	0	0	0	0	0
05/16/08	0	0	0	0.14E	0	0	0	0	0	0	0	0	0	0	0	0	0
05/17/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/18/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/19/08	0	0	0	0	0	0	0	0	0	0	0P	0	0	0	0	0	0
05/20/08	0.39	0.38	0.28	0.38	0.37	0.47	0.43	0.34	0.47	0.61	0.39	0.49	0	0	0.32	0	0
05/21/08	0.16	0.04	0.02	0.05	0.03	0.02	0.07	0.02	0.13	0.1	0.09	0.09	0	0	T	0	0
05/22/08	0.08	0.07	0.04	0.12	0.07	0.08	0.12	0.06	0.13	0.12	0.07	0.1	0	0	0.01	0	0
05/23/08	0.04	0.02	0.05	0.01	0.01	0.01	0.04	0.02	0.01	0.06	0.02	0.03	0	0	0.09	0	0
05/24/08	0.01	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0.01	0	0
05/25/08	0.05	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
05/26/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/27/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/28/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/29/08	0.05	0.02	0.02	0.07	0.02	0.01	0.09	0.03	0.03	0.02	0.01	0.03	0	0	0.05	0	0
05/30/08	0	0	0	0	0	0	0	0	0	0	0.01	T	0	0	0	0	0
05/31/08	0	0.15	0.04	0.04	0.12	0.02	0.05	0.03	0.15	0.33	0.2	0.01	0	0	T	0	0
Total	1.07	0.89	0.52	0.67	0.78	0.72	0.93	0.63	1.15	1.4	0.97	0.93	0.0		0.65	0.0	

- 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 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.