

**CITY OF SPOKANE,  
WASHINGTON**

**CSO FLOW MONITORING PROJECT**

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**FLOW, FREQUENCY AND DURATION**

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**SEWER MAINTENANCE**

**Monthly Report  
March 2010**

May 11, 2010  
*CSOMonthly2010-03.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				Missing data 3/8 07:50 to 3/8 07:55
2.	NW Blvd @ Kiernan	6	2	Total	293,960	320	Missing data 3/29 13:50 to 3/29 14:00
				3/21	111,008	90	
				3/29	182,952	230	
3.	Columbia @ Downriver	7	1	Total	7,951	20	Missing data 3/8 08:20 to 3/8 08:25 Missing data 3/22 08:40 to 3/22 08:45
				3/21	7,951	20	
4.	Nettleton @ York/Buckeye	10	1	Total	190	25	Missing data 3/8 08:25 to 3/8 08:30 Missing data 3/24 10:10 to 3/24 10:15
				3/21	190	25	
5.	Nora @ Pettet	12	3	Total	508,184	615	Missing data 3/22 08:45 to 3/22 08:50
				3/11	35,629	95	
				3/21	146,720	100	
				3/28	325,835	420	
6.	Sherwood @ Summit	14	None				
7.	Nettleton @ Ohio	15	None				Missing data 3/8 08:35 to 3/8 08:40
8.	A @ Linton	16B	None				Missing data 3/8 08:35 to 3/8 08:40

<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
9.	7 <sup>th</sup> @ Inland Empire	19	None				Missing data 3/1 08:20 to 3/1 08:25 Missing data 3/15 08:40 to 3/15 08:45
10.	3500 High Drive	20	None				Missing data 3/1 08:25 to 3/1 08:30
11.	Main @ Oak	22B	None				Missing data 3/8 07:35 to 3/8 07:45 Missing data 3/22 09:10 to 3/22 09:15
12.	Cedar @ Ide	23	2	Total	88,055	225	Missing data 3/8 08:45 to 3/8 08:55
				3/21	49,789	80	
				3/29	38,266	145	
13.	Riverside @ Cedar	24A	2	Total	243,712	415	Missing data 3/8 07:40 to 3/8 07:45 Missing data 3/22 09:15 to 3/22 09:20
				3/21	91,823	105	
				3/28	151,889	310	
14.	Riverside @ Cedar	24B	1	Total	591	30	Missing data 3/8 07:50 to 3/8 07:55
				3/21	591	30	
15.	Cedar @ Main	25	2	Total	40,962	120	Missing data 3/8 08:55 to 3/8 09:00
				3/21	30,499	70	
				3/29	10,463	50	
16.	Riverside @ Lincoln	26	2	Total	1,358,296	370	Missing data 3/8 08:45 to 3/8 08:50 Missing data 3/22 08:55 to 3/22 09:00
				3/21	646,708	95	
				3/29	711,588	275	
17.	Arthur @ 5 <sup>th</sup>	33A	1	Total	264	15	Missing data 3/1 10:25 to 3/1 10:30 Missing data 3/15 09:35 to 3/15 09:40
				3/29	264	15	
18.	Perry @ 3 <sup>rd</sup>	33B	None				Missing data 3/15 09:25 to 3/15 09:30
19.	Arthur @ 3 <sup>rd</sup>	33C	None				Missing data 3/15 09:30 to 3/15 09:35
20.	Arthur @ 1 <sup>st</sup>	33D	2	Total	13,702	205	Missing data 3/1 10:30 to 3/1 10:35 Missing data 3/15 09:40 to 3/15 09:45
				3/21	7,344	80	
				3/29	6,358	125	
21.	Riverside @ Napa/Crestline	34	None				Missing data 3/2 14:10 to 3/2 14:40 Missing data 3/15 09:20 to 3/15 09:25 Missing data 3/31 09:50 to 3/31 10:15

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	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	2	Total	267	210	Missing data 3/1 08:55 to 3/1 09:00 Missing data 3/15 09:15 to 3/15 09:20
				3/21	110	90	
				3/29	157	120	
23.	S. Riverton @ Altamont	39	None				Missing data 3/1 08:50 to 3/1 08:55
24.	S. Riverton @ Regal	40	None				Missing data 3/1 08:40 to 3/1 08:50 Missing data 3/2 10:45 to 3/2 11:05
25.	Rebecca @ Upriver	41	2	Total	14,397	260	Missing data 3/1 08:35 to 3/1 08:40
				3/21	10,854	70	
				3/29	3,543	190	
26.	Riverton @ Surro	42	None				
	<b>Monthly Total</b>		<b>23</b>		<b>2,570,531</b>	<b>2,830</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
03/01/10	0.01	0	0.01	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/02/10	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/03/10	0.03	0.01	0.01	0.03	0.01	0.02	0.04	0.02	0.02	0.06	X	0.04	0	0	0.06	0	0
03/04/10	0.01	0.01	0.01	0.03	0	0	0	0	0	0	X	T	0	0	0.13	0	0
03/05/10	0.01	0.01	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/06/10	0.01	0	0	0.01	0	0	0	0	0	0	X	0	0	0	0	0	0
03/07/10	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/08/10	0.02	0	0	0.03	0	0.01	0.02	0	0	0.03	X	0.03	0	0	T	0	0
03/09/10	0.01	0	0	0	0	0	0	0	0	0	X	0	0	0	T	T	0
03/10/10	0	0	0	0	0	0	0	0	0	0	X	T	T	0	T	T	0
03/11/10	0.22	0.17	0.08	0.15	0.16	0.14	0.17	0.2	0.17	0.3	X	0.15	T	0	0.24	T	0
03/12/10	0.12	0.18	0.04	0.08	0.13	0.05	0.09	0.09	0.17	0.15	X	0.11	T	T	0.17	0.2	0
03/13/10	0.05	0.04	0.02	0.01	0.02	0	0.01	0.02	0.02	0.02	X	0.01	T	0	T	T	0
03/14/10	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/15/10	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/16/10	0.01	0.01	0.01	0.02	0.01	0.03	0.01	0.02	0.03	0.06	X	0.01	0	0	T	0	0
03/17/10	0.01	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/18/10	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/19/10	0.01	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/20/10	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0
03/21/10	0.24	0.17	0.07	0.19	0.16	0.25	0.23	0.15	0.31	0.42	X	0.2	0	0	0.25	0	0
03/22/10	0.01	0	0.01	0	0	0	0.01	0.02	0	0.02	X	T	T	0	0.01	T	0
03/23/10	0	0	0	0	0	0	0	0	0	0	OP	0	0	0	0	0	0
03/24/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/25/10	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
03/26/10	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
03/27/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/28/10	0.27	0.25	0.12	0.21	0.26	0.21	0.27	0.22	0.44	0.42	0.21	0.25	0	0	0.32	0	0
03/29/10	0.47	0.44	0.24	0.35	0.43	0.46	0.41	0.47	0.83	0.87	0.49	0.4	0	0	0.56	0	0
03/30/10	0	0	0	0	0	0	0.01	0	0	0	0	T	0	0	T	T	0
03/31/10	0	0	0	0	0	0	0	0	0	0	0	T	T	0	T	T	0
<b>Total</b>	<b>1.51</b>	<b>1.29</b>	<b>0.62</b>	<b>1.11</b>	<b>1.18</b>	<b>1.17</b>	<b>1.27</b>	<b>1.21</b>	<b>1.99</b>	<b>2.35</b>	<b>0.7</b>	<b>1.20</b>	<b>0.0</b>		<b>1.74</b>	<b>0.2</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.