

Memo



Date: October 13, 2010
To: Kevin Stewart
From: Markus Ritsch
Subject: September 2010 ALERT Data Analysis

I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's Nova Star 4.0 base station (ALERT 2) were analyzed for the period September 1 through September 30, 2010.

II. General System Analysis Summary

A total of 335,128 ALERT (legacy) data reports were analyzed from the ALERT 2 base station. Meteorological sensors account for 78 percent, water level sensors 7 percent, and rain sensors 3 percent of the total monthly records.

The system-wide radio traffic loading was 11,171 reports per day with an average hourly loading of 465 reports. The peak hourly traffic loading was 569 reports, which occurred on September 23, between 12:00 PM and 1:00 PM. A plot of monthly average and peak hourly traffic loading is provided.

A. Specific Issues Identified this Month

Performance of the following sensors (Table 1) was unacceptable this month.

Table 1. Rain Sensors with Unacceptable Performance Characteristics

Rain ID	Description	Timer	Event	Comments
540	Parker/Mississippi	80%	100%	Poor performance, large number of invalid reports
1300	Hidden Lake	78%	100%	Poor performance
1710	Shop Creek	78%	100%	Poor performance
2230	Bear Cr below Blue	58%	100%	Poor performance
2240	Cold Spring Gulch Conf	75%	100%	Poor performance
2270	Cub Cr below Blue	87%	67%	Poor performance
4040	Martin Gulch	70%	67%	Poor performance
4270	Cannon Mountain	62%	100%	Poor performance, large number of invalid reports
4330	Hansen	72%	100%	Poor performance

III. Rain Sensor Timer Reporting Summary

The following analysis assumes that each rain sensor has a 12-hour timer-reporting interval. The worst performing rain sensors for the month are summarized (Table 2).

Table 2. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
--	--	--	2970	2970	2970	2980	2980	2230	--	--	--
--	--	--	3010	700	1710	2930	2930	4270	--	--	--
--	--	--	700	2240	4330	2990	2990	4040	--	--	--
--	--	--	4860	4330	2270	3020	3020	4330	--	--	--
--	--	--	4330	4490	2240	2810	2810	2240	--	--	--
--	--	--	4170	4270	4470	4330	4330	1710	--	--	--

*- Due to system start-up/shut-down, timer statistics are evaluated only when the entire network is operational between April 1 and October 15.

Sensors identified as having poor timer performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

IV. Rain Sensor Event Reporting Summary

A. District-Wide Total Tip/Count Statistics

The incrementing reports from all 1-mm rain sensors were analyzed to quantify the District-wide statistical total monthly tip summary (Table 3).

Table 3. District-Wide Total Tip/Count Statistical Summary

Statistical Parameter	Value	Comments
Mean	4.18	Only the 1-mm rain sensors were included in the analysis
Median	3	Only the 1-mm rain sensors were included in the analysis
Standard deviation	6.93	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	25	Only the 1-mm rain sensors were included in the analysis
Minimum total count	0	Many sensors
Maximum total count	54	ID 1500 (Powers Park) – influenced by irrigation

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 4).

Table 4. Monthly Summary of District-Wide Mean Total 1-mm Tip/Count

Year	Jan	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov	Dec	Ave
2006	4.62	5.92	18.39	20.47	19.44	13.75	74.03	46.89	24.17	41.13	5.04	16.45	24.19
2007	11.56	5.40	29.75	65.03	68.30	15.87	36.20	46.38	22.13	29.50	6.54	11.29	29.00
2008	4.05	7.38	12.26	20.57	54.82	26.06	16.43	90.20	37.54	19.59	2.82	9.24	25.08
2009	6.33	3.11	11.37	59.26	63.45	68.00	65.00	20.00	27.29	30.24	11.00	5.60	30.89
2010	5.97	11.90	32.54	70.57	39.63	56.04	50.23	31.01	4.18				

*-Event statistics are skewed in these months because system start-up/shut-down occurs. The rain network is operational between April 1 and October 15. Only the weather stations remain operational throughout the year.

C. Sensors with a Jump of Six or More in the Sequential Count

Several sensors experienced a large jump in the sequential tip count (Table 5).

Table 5. Sensors with a Jump of 6 or More in Sequential Count

Sensor Description	Sensor ID	Comment
		There were no sensors this month that had a tip jump of more than 6!!

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 96 percent. A total of 635 incrementing reports were received and a total of 665 were expected. The total loss of incrementing reports for the month was approximately 4 percent. Those sensors with the worst event transmission performance are summarized (Table 6).

Table 6. Monthly Summary of Sensors with the Most Missed Tips

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
--	--	--	2970	700	2900	870	2270	110	--	--	--
--	--	--	700	2280	2190	540	2980	2970	--	--	--
--	--	--	940	2970	2930	2980	2280	720	--	--	--
--	--	--	430	2980	4330	2900	4090	1900	--	--	--
--	--	--	2900	2190	2980	4330	310	2270	--	--	--
--	--	--	4330	2240	2970	2230	4330	4040	--	--	--

*-Event statistics are skewed in these months and therefore not computed because system start-up/shut-down occurs. The rain network is operational between April 1 and October 15.

Sensors identified as having poor event performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

V. Heavy Radio Traffic Analysis

Periods exceeding 500 messages per hour were analyzed independently in an attempt to quantify data loss rates from rain sensors using the sequential tip count series.

A. The Heaviest Hourly Traffic Periods This Month

The hours of highest radio traffic this month are shown (Table 7).

Table 7. Heavy Radio Traffic Periods

Peak Traffic Periods	Reports/hour	Hour Beginning
Peak Hourly Traffic	569	9/23/2010 12:00 PM
2nd Max	567	9/7/2010 1:00 PM
3rd Max	566	9/29/2010 12:00 PM
4th Max	558	9/23/2010 11:00 AM
5th Max	556	9/9/2010 10:00 AM

Each hour exceeding 500 reports was analyzed to quantify the number of missing rain reports for that hour (Figure 1). The following plot shows the loss of data as a function of data loading.

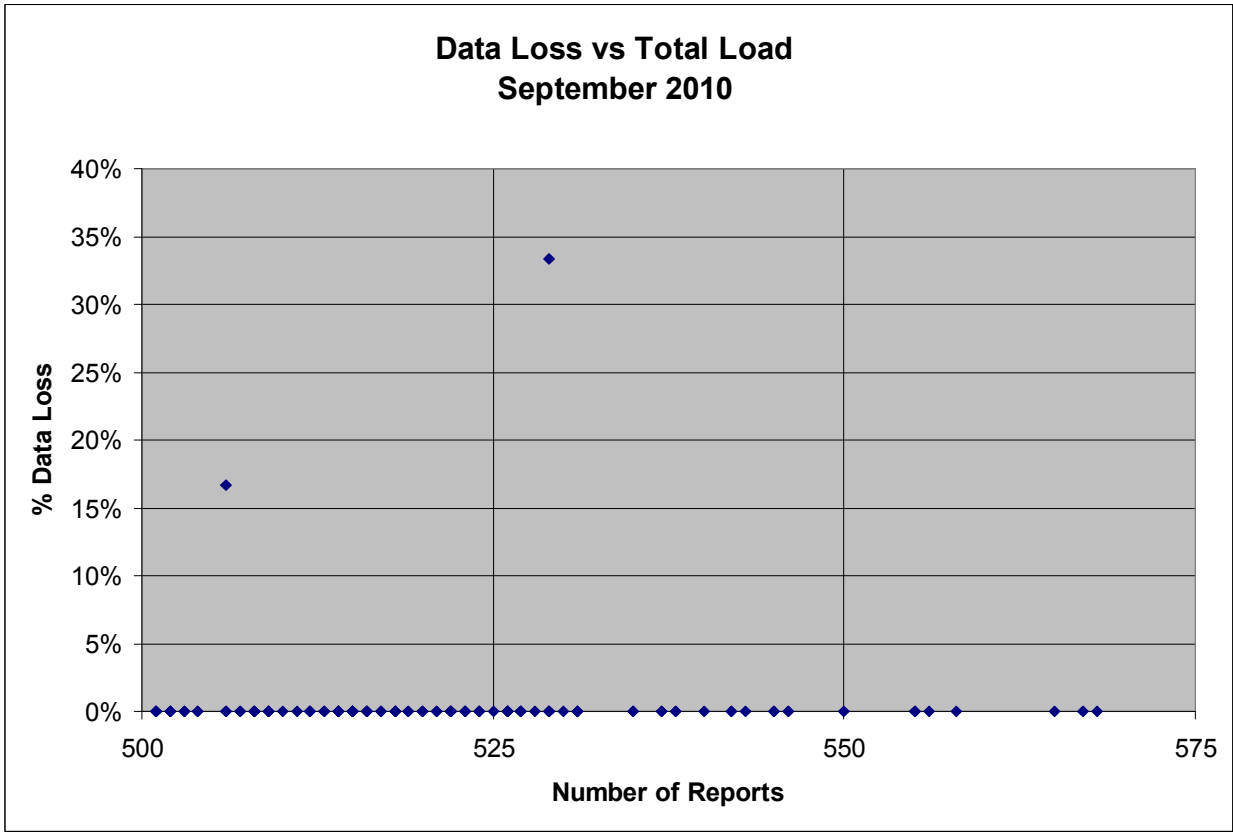


Figure 1. Data Loss vs. Data Loading

VI. Unknown Device Analysis – Received Data Log

The ALERT IDs present in the audio signal received by the decoder are compared against a list of “active” device IDs that are defined within NovaStar. Those IDs received by the decoder that are not defined within NovaStar are considered to be “unknown” and may be the result of radio noise or problems with the telemetry system. The reception of “unknown” device reports for the month is summarized (Table 8).

Table 8. Summary of Unknown IDs

Description	Quantity
Total number of unknown IDs (IDs without a device definition)	167
Total reports from unknown IDs	442
Unknown IDs with only a single received report (potential noise)	144
Total reports from all IDs – RecData Log entire month	335,128
Unknown reports as a fraction of total reports	0.13%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 9) are the total reports received from unknown sensor IDs for each month of the year.

Table 9. Monthly Summary of Total Reports from Unknown IDs

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
2010	1,220	1,474	1,276	1,174	721	5,707	610	1,738	442				

A number of “unknown” sensors had multiple reports, which may indicate the existence of a transmitter that is sending information on an ID that is not currently defined within NovaStar. The unknown IDs with multiple reports including the number of reports received by each are shown (Table 10).

Table 10. Reports Received by Unknown IDs

Unknown IDs	Number of Reports
2993	234
2239	9
497	5
1663	5
2215	4
487	3
685	3
2736	3
4087	3
119	2
241	2
642	2
659	2
748	2
756	2
1602	2
2084	2
2221	2
2729	2
4379	2
4831	2
4832	2
4848	2

The “unknown” device reports are analyzed temporally to understand when they are received during the day (Table 11). The goal of this analysis is to determine a pattern of occurrence that may correspond to a source of noise in the system, such as the use of a wireless microphone nearby.

Table 11. Temporal Distribution of Received Reports

Hour (AM)	Reports	Hour (PM)	Reports
0:00-00:59	38	12:00-12:59	41
1:00-1:59	3	1:00-1:59	19
2:00-2:59	5	2:00-2:59	12
3:00-3:59	33	3:00-3:59	37
4:00-4:59	7	4:00-4:59	12
5:00-5:59	9	5:00-5:59	10
6:00-6:59	33	6:00-6:59	38
7:00-7:59	5	7:00-7:59	8
8:00-8:59	8	8:00-8:59	8
9:00-9:59	41	9:00-9:59	35
10:00-10:59	16	10:00-10:59	3
11:00-11:59	14	11:00-11:59	7

VII. Sensors with Invalid Reports

The following precipitation sensors had a large number of invalid reports (bit flip/contention errors/random decode):

Sensor ID	Description	Feb	Mar	Apr	May	June	July	Aug	Sep
540	Parker/Mississippi	0	0	0	0	0	0	0	3
700	Toll Gate @ 6 th	0	0	0	0	3	0	1	0
1300	Hidden Lake	0	0	0	4	0	1	0	0
1460	Urban Farm	1	3	2	1	0	0	0	0
1530	Bear Creek at Lowell	12	13	10	6	0	0	0	0
1900	Niver Detention	0	0	0	0	0	4	0	0
2190	Squaw Mountain	0	0	0	0	0	0	0	2
2320	Choke Cherry Resvr	1	7	3	4	5	0	3	0
2750	Castle Rock WX	--	4	6	1	0	2	0	0
2970	Rampart Range Road	--	3	0	1	0	0	0	0
3010	East Plum Cr at Hwy 105	0	0	0	0	9	12	5	0
4030	Red Garden	6	2	3	1	1	0	0	0
4270	Cannon Mountain	--	--	--	--	--	--	3	2
4330	Hansen	2	1	2	0	4	4	1	1

General System Analysis

Database Name P:\A207-UDFCD-Data-Analysis\2010\09-2010\Novastar_extract_2010Sep

First Date in Database	9/1/10 12:00 AM	Total Days	30.0
Last Date in Database	9/30/10 11:59 PM	Total Hours	720.0

Total Records Analyzed 335128

Records by Group

Wind Gust	56067	17%
Temperature	55529	17%
Relative Humidity	53747	16%
Barometric Pressure	24445	7%
Wind Direction	20793	6%
Wind Speed Average & Azimuth	20648	6%
Wind Speed Average	20450	6%
Water Level PT-HSE	16196	5%
Precipitation	11525	3%
Solar Radiation	9461	3%
Battery Voltage HSE	8245	2%
Fuel Moisture	5687	2%
Fuel Temperature	5686	2%
Battery	4220	1%
Water Level Float	4052	1%
Battery Voltage Analog	3699	1%
Battery Voltage Digital	3547	1%
Soil Moisture	2854	1%
Water Level PT	2747	1%
Repeater Status Report	2268	1%
Wing Gust	716	0%
Repeater Pass List	577	0%
Hayman Battery	522	0%
12Hr Status Report	507	0%
Unknown IDs	442	0%
Battery Voltage	232	0%
Water Level	135	0%
Hayman Stage	72	0%
Handar 585 ALARM Status	58	0%
ALERT/A2 Testing	1	0%
Total	335128	

Records by Major Group

Meteorologic Sensors	261140	78%
Water Level Sensors	22995	7%
Sensor Status Transmissions	18901	6%
Soil and Fuel Sensors	14227	4%
Rain Sensors	11525	3%
Total	328788	

Traffic Loading Summary

Alert Reports	335128	
Average Daily Traffic	11171	
Average Hourly Traffic	465	
Median Hourly Traffic	461	hour beginning
Peak Hourly Traffic	569	9/23/10 12:00 PM
2nd Max	567	9/7/10 1:00 PM
3rd Max	566	9/29/10 12:00 PM
4th Max	558	9/23/10 11:00 AM
5th Max	556	9/9/10 10:00 AM

Rain Timer Performance

Analyze Rain Sensors

h Timer Performance

Rain Sensors	Description	Rcv	Timer Interval	Ave Exp	92% Performance
2230	Bear Cr below Cub	35	20:18	60.00	58%
4270	Cannon Mountain	37	19:42	60.00	62%
4040	Martin Gulch	42	16:45	60.00	70%
4330	Hansen Rain	43	15:10	60.00	72%
2240	Cold Sprg Glch conf	45	15:23	60.00	75%
1300	Hidden Lake	47	12:19	60.00	78%
1710	Shop Creek	47	14:40	60.00	78%
540	Parker/Mississippi	48	14:45	60.00	80%
2950	DC Public Works	48	14:48	60.00	80%
4490	Apple Valley	48	14:02	60.00	80%
4570	St. Antons	48	14:10	60.00	80%
430	Utah Park	49	14:00	60.00	82%
2970	Rampart Range Rd	49	13:47	60.00	82%
2250	Rosedale	50	14:12	60.00	83%
2910	East Cherry Cr-Douglas	51	12:57	60.00	85%
4240	Sunset	51	13:55	60.00	85%
4820	Doudy Draw	51	13:40	60.00	85%
640	Goldsmith @ Eastman	52	12:49	60.00	87%
1030	NREL/S. Table Mtn.	52	13:26	60.00	87%
2270	Cub Cr below Blue	52	13:40	60.00	87%
4550	Boulder Jail	52	12:57	60.00	87%
110	Ralston Reservoir	53	12:54	60.00	88%
1360	Denver Zoo	53	13:26	60.00	88%
4050	Walker Ranch	53	13:21	60.00	88%
4060	Lakeshore	53	13:24	60.00	88%
310	Guy Hill Ranch	54	13:07	60.00	90%
1600	Englewood Dam	54	13:07	60.00	90%
2310	Genesee Village	54	13:05	60.00	90%
2820	Haskins Gulch Conf	54	12:39	60.00	90%
2980	Dakan Rd	54	12:54	60.00	90%
4080	Twin Sisters	54	13:08	60.00	90%
4100	Filter Plant	54	13:22	60.00	90%
4110	Betasso	54	13:08	60.00	90%
4140	Logan Mill	54	13:08	60.00	90%
4200	Lazy Acres	54	13:07	60.00	90%
4340	Riverside	54	13:08	60.00	90%
4510	Pinewood Springs	54	12:39	60.00	90%
4790	Wx-Button Rock	54	12:56	60.00	90%
4850	Porphory Mtn	54	13:09	60.00	90%
410	Kelly Dam	55	12:24	60.00	92%
850	Flying J	55	12:44	60.00	92%
1480	Third Creek at DIA	55	12:52	60.00	92%
1660	SPR at Henderson	55	12:57	60.00	92%
2850	Cherry Cr bl Bayou Glch	55	12:54	60.00	92%
2940	Willow Creek - DougCnty	55	12:40	60.00	92%
4010	Crescent	55	12:39	60.00	92%
4070	Bear Peak	55	12:39	60.00	92%
4160	Sunshine	55	12:52	60.00	92%
4180	Gold Lake	55	12:52	60.00	92%
4220	Fling's	55	12:25	60.00	92%
4260	Taylor Mountain	55	12:53	60.00	92%
4290	Red Hill	55	12:39	60.00	92%
4310	Johnny Park	55	12:53	60.00	92%
4470	Little Narrows	55	12:53	60.00	92%

4520	Eagle Ridge	55	12:27	60.00	92%
4530	Winiger Ridge	55	12:53	60.00	92%
4810	Shanahan Ridge	55	12:52	60.00	92%
150	Nott Creek	56	12:38	60.00	93%
220	Upper Leyden	56	12:26	60.00	93%
610	Harvard @ Jackson	56	12:11	60.00	93%
840	Fire Station 12	56	12:39	60.00	93%
1000	Maple Grove Resv.	56	12:38	60.00	93%
1100	Louisville Rec Ctr	56	12:38	60.00	93%
1110	Gunbarrel	56	12:37	60.00	93%
1320	SPR at 3rd Ave	56	12:25	60.00	93%
1440	Wx-Elbert	56	12:40	60.00	93%
2930	Wx-Spring Valley Rd-DougCnty	56	12:40	60.00	93%
2990	Wx-Tomah Rd-DougCnty	56	12:39	60.00	93%
3010	EPC at Hwy 105	56	12:40	60.00	93%
4090	Magnolia	56	12:37	60.00	93%
4190	Slaughterhouse	56	12:37	60.00	93%
4250	Geer Canyon	56	12:37	60.00	93%
4770	Wx-Cal-Wood Ranch	56	12:40	60.00	93%
4830	SBC @ San Souci	56	12:39	60.00	93%
600	Harvard Gulch Park	57	12:11	60.00	95%
620	Quincy/Highline	57	12:23	60.00	95%
630	Temple Pond at DTC	57	11:56	60.00	95%
650	Iliff Pond	57	12:24	60.00	95%
720	Confluence Pond	57	12:24	60.00	95%
800	Sable Ditch @ 18th	57	12:23	60.00	95%
860	Sand Cr at Colfax	57	12:12	60.00	95%
1010	Denver West	57	12:24	60.00	95%
1050	Jeffco Fairgrounds	57	12:24	60.00	95%
1060	Heritage Square	57	12:23	60.00	95%
1310	LDC at 64th	57	12:24	60.00	95%
1350	Chatfield COE	57	12:25	60.00	95%
1420	Wx-Diamond Hill	57	12:00	60.00	95%
1500	Powers Park	57	11:58	60.00	95%
1810	Sand Creek at mouth	57	12:24	60.00	95%
1920	Wx-Brighton	57	12:13	60.00	95%
2370	Red Rocks Park	57	12:24	60.00	95%
2840	Sulphur Gulch	57	12:26	60.00	95%
3020	Wx-West Creek WX	57	12:13	60.00	95%
4130	Swiss Peaks	57	12:25	60.00	95%
4150	Gold Hill	57	12:24	60.00	95%
4230	Golden Age	57	12:24	60.00	95%
4300	Big Elk Park	57	12:24	60.00	95%
4350	Conifer Hill	57	12:24	60.00	95%
4360	Justice Center	57	12:10	60.00	95%
4840	SBC@S Boulder Ditch	57	12:11	60.00	95%
100	Carr Street	58	11:58	60.00	97%
120	West Woods	58	12:24	60.00	97%
140	Wx-Blue Mountain	58	12:13	60.00	97%
200	Leyden Reservoir	58	12:10	60.00	97%
210	Leyden Confluence	58	12:23	60.00	97%
330	Van Bibber @ Hwy 93	58	12:10	60.00	97%
440	Fire Station #7	58	12:10	60.00	97%
500	Havana Park	58	12:09	60.00	97%
510	Virginia Court	58	11:57	60.00	97%
530	Fire Station #19	58	11:57	60.00	97%
710	Horseshoe Park Drop	58	12:10	60.00	97%
900	Wx-Aurora Reservoir	58	12:21	60.00	97%
970	Pump Sta 3	58	12:13	60.00	97%

1040	Lena @ U.S. Hwy 6	58	12:10	60.00	97%
1200	Broomfield 3207	58	12:23	60.00	97%
1330	Roslyn	58	12:12	60.00	97%
1340	Sanderson at Xavier	58	12:00	60.00	97%
1370	West Metro FS13	58	12:23	60.00	97%
1400	Upper Sloan Det.	58	12:25	60.00	97%
1520	Wx-Marston Lake North	58	12:13	60.00	97%
1530	Bear Creek @ Lowell	58	12:10	60.00	97%
1640	SPR at Union Ave.	58	12:00	60.00	97%
1700	Cherry Cr @ Champa	58	12:00	60.00	97%
1720	Cherry Cr @ Steele	58	12:10	60.00	97%
1900	Niver Detention	58	12:11	60.00	97%
2190	Wx-Squaw Mountain	58	12:00	60.00	97%
2210	Wx-Hiwan G.C.	58	12:12	60.00	97%
2260	Brook Forest	58	12:10	60.00	97%
2280	Kinney Peak	58	12:23	60.00	97%
2350	Idledale	58	12:23	60.00	97%
2810	Pine Cliff Road	58	12:00	60.00	97%
2870	Cottonwood (Apache)	58	12:10	60.00	97%
2900	Russelville Gulch-Douglas	58	12:12	60.00	97%
2960	Indian Creek	58	12:13	60.00	97%
4030	Red Garden	58	12:12	60.00	97%
4170	Pine Brook	58	12:12	60.00	97%
4710	Wx-Ward C-1	58	12:00	60.00	97%
4750	Wx-Louisville Lake	58	12:13	60.00	97%
4860	Fairview Peak	58	12:12	60.00	97%
300	Van Bibber Park	59	11:57	60.00	98%
320	Sports Complex	59	11:58	60.00	98%
420	Expo Park	59	11:57	60.00	98%
520	Jewell Detention	59	12:12	60.00	98%
700	Toll Gate @ 6th	59	12:00	60.00	98%
730	No Name @ Quincy	59	11:57	60.00	98%
760	Mission Viejo Park	59	12:10	60.00	98%
810	Granby Ditch @ 6th	59	11:58	60.00	98%
820	ETG @ Buckley	59	12:10	60.00	98%
830	Side Creek Park	59	11:57	60.00	98%
870	Murphy Creek GC	59	12:00	60.00	98%
920	Wx-Aurora Town Hall	59	12:00	60.00	98%
940	Sampson Gulch	59	12:09	60.00	98%
950	Piney at Liverpool	59	12:10	60.00	98%
1550	Lakewood CC	59	11:57	60.00	98%
1800	Sand Creek Park	59	11:57	60.00	98%
2330	Morrison	59	11:58	60.00	98%
2340	El Rancho	59	11:57	60.00	98%
2360	Indian Hills	59	11:57	60.00	98%
2710	Wx-Highlands Ranch WTP	59	12:00	60.00	98%
2730	Wx-Salisbury Park	59	12:00	60.00	98%
2750	Wx-Castle Rock	59	12:00	60.00	98%
2860	CC at Stroh Rd	59	12:10	60.00	98%
2920	West Cherry Head-Douglas Cnty	59	12:00	60.00	98%
4020	Rio Grande	59	11:58	60.00	98%
4730	Wx-Sugarloaf	59	12:00	60.00	98%
400	Montview Park	60	11:58	60.00	100%
1460	Wx-Urban Farm	60	11:53	60.00	100%
1620	Slaughterhouse Glch	60	11:58	60.00	100%
750	Wx-Quincy Reservoir	62	11:33	60.00	103%
1570	Wx-Brighton Ditch	63	11:08	60.00	105%
2320	Choke Cherry Resvr	207		60.00	
5720	Four Mile Creek	26	3:00	60.00	43%

5730	West Creek	52	12:14	60.00	87%
5740	Trail Creek	59	12:00	60.00	98%
5760	Cheeseman	12	10:54	60.00	20%
5770	Lazy Gulch	53	13:24	60.00	88%
5790	Flying G	56	12:40	60.00	93%
5810	Stump Bump	56	12:40	60.00	93%
5820	Corral Creek	45	15:54	60.00	75%
5830	Platte Springs	57	12:26	60.00	95%
5860	Cedar Mountain	52	13:40	60.00	87%
5880	Hackett Mountain	54	12:27	60.00	90%
5930	Long Hollow	60	7:07	60.00	100%
5940	Log Jumper	30	19:42	60.00	50%

Rain Event Performance														
		Reports Received	635	Analyze Rain Sensors										
	Systemwide Avg	Total Tips	665											
	95.49%	Data Loss	4.51%											
Rain ID	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket	
110	50%	0	1	0	0	0	0	0	1	2	1	0	0.0393701	
2970	50%	0	1	0	0	0	0	0	1	2	1	0	0.0393701	
720	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701	
1900	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701	
2270	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701	
4040	67%	2	2	0	0	0	0	0	4	6	2	0	0.0393701	
4470	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701	
4010	71%	3	2	0	0	0	0	0	5	7	2	0	0.0393701	
1110	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701	
1340	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701	
1640	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701	
4810	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701	
420	80%	3	1	0	0	0	0	0	4	5	1	0	0.0393701	
4550	82%	8	0	1	0	0	0	0	9	11	2	0	0.0393701	
1400	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701	
4050	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701	
4060	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701	
4750	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701	
2190	88%	6	1	0	0	0	0	0	7	8	1	0	0.0393701	
4840	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701	
430	94%	41	3	0	0	0	0	0	44	47	3	0	0.0393701	
630	96%	45	2	0	0	0	0	0	47	49	2	0	0.0393701	
1500	96%	50	2	0	0	0	0	0	52	54	2	0	0.0393701	
100	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
120	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701	
140	100%	5	0	0	0	0	0	0	5	5	0	1	0.0393701	
150	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701	
200	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701	
210	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
220	100%	2	0	0	0	0	0	0	2	2	0	1	0.0393701	
300	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
310	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701	
320	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701	
330	100%	2	0	0	0	0	0	0	2	2	0	1	0.0393701	
400	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
410	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
500	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701	
510	100%	18	0	0	0	0	0	0	18	18	0	0	0.0393701	
520	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701	
530	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
600	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701	
610	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701	
640	100%	11	0	0	0	0	0	0	11	11	0	0	0.0393701	
650	100%	3	0	0	0	0	0	0	3	3	0	1	0.0393701	
700	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
710	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
730	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
750	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701	
760	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701	
800	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
820	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
850	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701	
860	100%	1	0	0	0	0	0	0	1	1	0	1	0.0393701	
870	100%	3	0	0	0	0	0	0	3	3	0	1	0.0393701	
900	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393699	
920	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701	
940	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393699	
950	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701	
970	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701	
1000	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
1010	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
1030	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701	
1040	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
1050	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
1100	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701	
1200	100%	4	0	0	0	0	0	0	4	4	0	1	0.0393701	
1300	100%	17	0	0	0	0	0	0	17	17	0	0	0.0393701	
1310	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
1320	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701	
1360	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
1420	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701	

1440	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
1460	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
1480	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
1520	100%	3	0	0	0	0	0	0	0	3	3	0	1	0.0393701
1530	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
1550	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
1570	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
1600	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
1620	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
1660	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
1700	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
1710	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
1720	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
1810	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
1920	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
2230	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2240	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
2250	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
2260	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
2280	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
2320	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2340	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
2360	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2370	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2730	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2810	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2820	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
2840	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
2850	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2860	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
2870	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2900	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2920	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2930	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2960	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
3010	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.01
3020	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4020	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
4030	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
4070	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
4080	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
4090	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
4100	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4110	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
4130	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4140	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4150	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4160	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4170	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4180	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4190	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4220	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4230	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4240	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4250	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4260	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
4270	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4290	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4300	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
4310	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
4330	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4340	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
4350	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4360	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
4490	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4510	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4520	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
4530	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
4570	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
4710	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
4730	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
4770	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
4790	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
4820	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701

4830	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
4850	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.01
4860	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.01
5720	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
5730	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
5740	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
5770	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
5790	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
5810	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
5820	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
5830	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
5860	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
5880	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
5940	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
	Total Tips	606	28	1	0	0	0	0	0	635	665	30	8	

Monthly Traffic Loading

2010 Monthly ALERT Radio Traffic Summary

