



Water-Data Report 2012

**02085000 ENO RIVER AT HILLSBOROUGH, NC**

Neuse Basin  
Upper Neuse Subbasin

LOCATION.--Lat 36°04'16", long 79°05'44" referenced to North American Datum of 1983, Orange County, NC, Hydrologic Unit 03020201, on left bank 900 ft downstream of bridge on North Carolina Highway 86 at Hillsborough, and 2 mi downstream of Sevenmile Creek.

DRAINAGE AREA.--66 mi<sup>2</sup>.

**SURFACE-WATER RECORDS**

PERIOD OF RECORD.--October 1927 to September 1971, October 1985 to current year.

REVISED RECORDS.--WDR NC-96-1: 1945, annual maximum discharge.

GAGE.--Water-stage recorder. Datum of gage is 487.44 ft above National Geodetic Vertical Datum of 1929. Telephone and satellite telemetry at streamgage.

REMARKS.--Records good. Maximum gage height for period of record, 21.13 ft, from high-water mark in gage shelter. No flow for part of September 13, 2002. Minimum discharge for current year also occurred October 25.

## 02085000 ENO RIVER AT HILLSBOROUGH, NC—Continued

**DISCHARGE, CUBIC FEET PER SECOND**  
**WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012**  
**DAILY MEAN VALUES**

<b>Day</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>
<b>1</b>	3.2	3.2	22	16	12	25	21	9.7	17	2.9	4.3	3.0
<b>2</b>	3.2	3.3	14	15	12	23	18	8.3	25	2.4	2.6	3.7
<b>3</b>	3.1	3.2	11	14	11	128	15	7.9	16	1.8	2.8	57
<b>4</b>	2.8	168	9.2	13	11	78	14	6.6	9.9	1.6	2.6	66
<b>5</b>	1.4	44	8.1	12	13	44	16	173	6.7	2.6	2.8	13
<b>6</b>	1.5	15	7.3	11	13	32	15	241	7.0	7.9	2.4	42
<b>7</b>	1.9	8.0	18	10	12	27	13	48	6.3	7.2	4.4	55
<b>8</b>	1.4	4.7	30	9.8	12	25	11	26	5.1	3.2	3.8	33
<b>9</b>	1.2	4.6	20	10	11	26	9.3	31	3.7	4.8	1.5	73
<b>10</b>	1.1	4.4	14	10	11	26	8.0	30	3.1	7.3	7.3	17
<b>11</b>	1.0	3.3	11	13	11	22	6.6	17	3.1	73	71	8.7
<b>12</b>	2.6	3.4	9.1	21	15	20	6.4	13	4.6	33	22	7.1
<b>13</b>	1.9	4.0	8.5	18	14	19	6.8	11	4.1	11	7.4	5.4
<b>14</b>	2.4	3.0	8.3	15	15	19	10	20	3.4	5.4	4.3	4.8
<b>15</b>	2.3	3.1	8.0	14	10	17	10	52	3.0	4.2	2.7	4.3
<b>16</b>	1.9	5.0	8.3	13	11	16	11	27	3.5	3.7	2.2	8.4
<b>17</b>	2.6	25	25	13	13	15	9.9	19	3.3	4.2	2.2	8.9
<b>18</b>	2.3	29	22	12	13	22	9.3	13	3.0	3.5	2.2	476
<b>19</b>	15	14	15	10	18	19	10	10	3.0	2.5	27	217
<b>20</b>	5.5	9.3	14	9.5	45	16	9.7	8.8	2.6	1.5	11	45
<b>21</b>	2.8	6.6	29	14	44	26	11	7.5	2.5	2.9	6.2	21
<b>22</b>	0.71	5.7	79	15	31	24	39	7.3	5.9	12	4.3	13
<b>23</b>	0.25	6.0	54	14	31	18	40	44	3.9	10	3.7	8.6
<b>24</b>	0.22	4.6	33	14	36	103	22	26	3.3	21	3.3	5.6
<b>25</b>	0.34	4.0	24	13	52	479	15	16	3.1	5.6	3.0	5.0
<b>26</b>	0.63	3.6	21	12	35	98	16	11	2.5	2.8	2.8	5.9
<b>27</b>	1.1	4.0	22	17	30	53	16	8.5	2.0	1.7	2.4	5.8
<b>28</b>	0.88	4.1	28	17	30	37	13	7.3	2.0	6.0	1.3	4.7
<b>29</b>	6.7	126	30	15	27	31	11	6.0	2.5	42	1.7	36
<b>30</b>	4.1	53	20	13	---	25	10	6.8	2.5	9.7	1.9	24
<b>31</b>	3.1	---	17	12	---	21	---	7.0	---	7.0	2.4	---
<b>Total</b>	79.13	575.1	639.8	415.3	599	1,534	423.0	919.7	163.6	304.4	219.5	1,277.9
<b>Mean</b>	2.55	19.2	20.6	13.4	20.7	49.5	14.1	29.7	5.45	9.82	7.08	42.6
<b>Max</b>	15	168	79	21	52	479	40	241	25	73	71	476
<b>Min</b>	0.22	3.0	7.3	9.5	10	15	6.4	6.0	2.0	1.5	1.3	3.0
<b>Cfsm</b>	0.04	0.29	0.31	0.20	0.31	0.75	0.21	0.45	0.08	0.15	0.11	0.65
<b>In.</b>	0.04	0.32	0.36	0.23	0.34	0.86	0.24	0.52	0.09	0.17	0.12	0.72

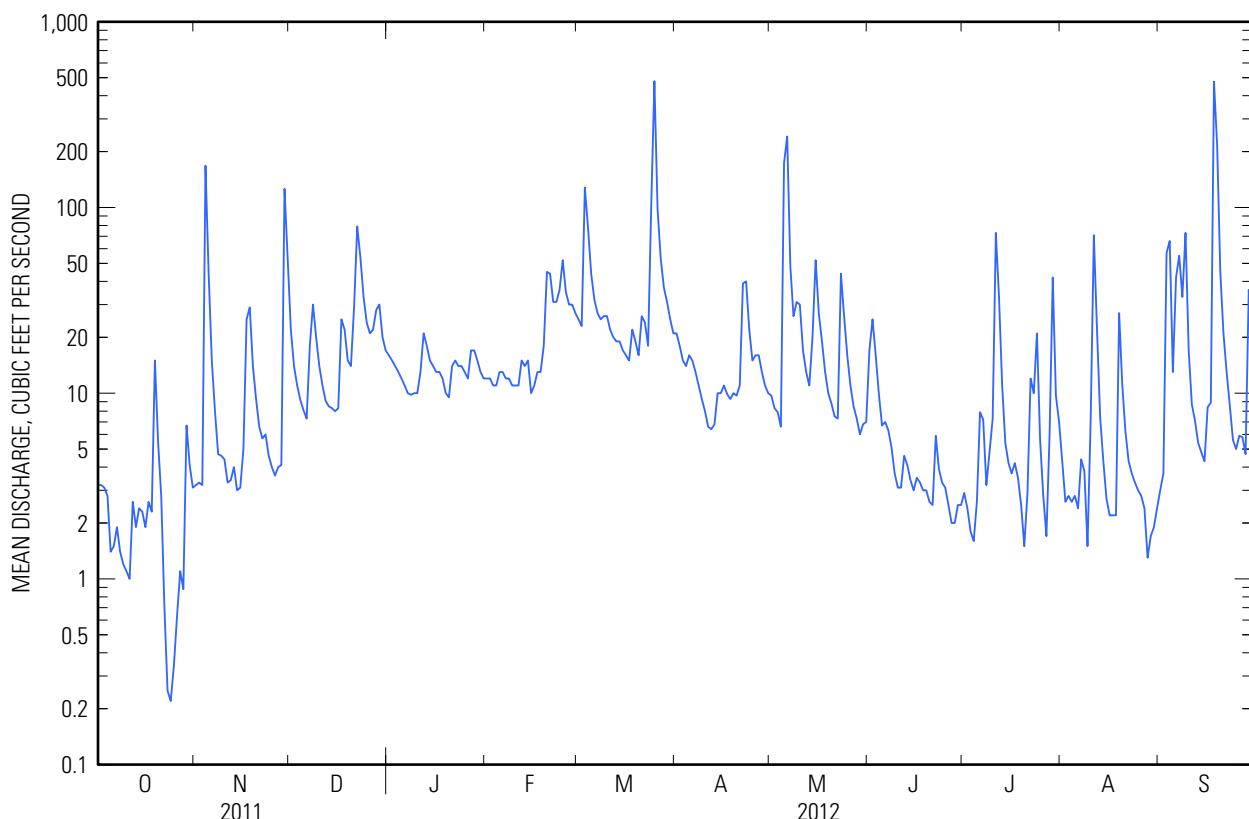
**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 2012<sup>a</sup>, BY WATER YEAR (WY)**

	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>
<b>Mean</b>	26.8	43.4	56.8	84.4	104	115	90.5	48.1	37.1	34.8	30.1	36.8
<b>Max</b>	181	213	183	326	311	354	304	175	210	359	256	342
(WY)	(1930)	(1986)	(2003)	(1936)	(1998)	(1998)	(2003)	(2003)	(1995)	(1938)	(1939)	(1945)
<b>Min</b>	0.63	0.82	3.64	4.55	10.3	15.7	12.4	4.17	1.75	1.28	0.85	0.28
(WY)	(1987)	(1942)	(1942)	(2008)	(2008)	(2006)	(2002)	(2002)	(1986)	(1986)	(1987)	(1954)

## 02085000 ENO RIVER AT HILLSBOROUGH, NC—Continued

## SUMMARY STATISTICS

	Calendar Year 2011		Water Year 2012		Water Years 1928 - 2012	
<b>Annual total</b>	5,987.38		7,150.43			
<b>Annual mean</b>	16.4		19.5		58.7	
<b>Highest annual mean</b>					154	2003
<b>Lowest annual mean</b>					9.67	2002
<b>Highest daily mean</b>	173	Mar 31	479	Mar 25	4,600	Sep 6, 1996
<b>Lowest daily mean</b>	0.22	Oct 24	0.22	Oct 24	0.02	Jul 10, 1986
<b>Annual seven-day minimum</b>	0.59	Oct 22	0.59	Oct 22	0.10	Oct 6, 1954
<b>Maximum peak flow</b>			1,620	Sep 18	10,800	Sep 6, 1996
<b>Maximum peak stage</b>			10.96	Sep 18	b21.13	Sep 6, 1996
<b>Instantaneous low flow</b>			b0.13	Oct 24	0.00	Sep 13, 2002
<b>Annual runoff (cfsm)</b>	0.249		0.296		0.890	
<b>Annual runoff (inches)</b>	3.37		4.03		12.09	
<b>10 percent exceeds</b>	38		36		110	
<b>50 percent exceeds</b>	8.0		10		24	
<b>90 percent exceeds</b>	2.3		2.5		3.6	

<sup>a</sup> See Period of Record.<sup>b</sup> See Remarks.

**02085000 ENO RIVER AT HILLSBOROUGH, NC—Continued****WATER-QUALITY RECORDS**

PERIOD OF RECORD.--Water years 1990 to current year.

REMARKS.--Station operated to define water quality as part of a regional surface-water quality assessment.

**WATER-QUALITY DATA  
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012**

Part 1 of 6

[%, percent; ANC, acid neutralizing capacity; CaCO<sub>3</sub>, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO<sub>2</sub>, silicon dioxide; ft<sup>3</sup>/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Sample start time	Medium name	Sample type	Barometric pressure, mm Hg (00025)	Discharge, instantane-ous, ft <sup>3</sup> /s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	Dissolved oxygen, water, unfiltered, % saturation (00301)	pH, water, unfiltered, field, standard units (00400)
<b>10-25-2011</b>	<b>1230</b>	Surface water	Regular	755	0.36	5.2	49	6.8
<b>10-25-2011</b>	<b>1231</b>	<i>QC sample - Surface water</i>	<i>Duplicate</i>	--	--	--	--	--
<b>10-25-2011</b>	<b>1310</b>	<i>QC sample - Artificial</i>	<i>Blank</i>	--	--	--	--	--
<b>11-29-2011</b>	<b>1145</b>	Surface water	Regular	745	219	8.5	81	7.1
<b>12-19-2011</b>	<b>1115</b>	Surface water	Regular	755	16	11.5	92	6.9
<b>02-01-2012</b>	<b>1130</b>	Surface water	Regular	755	13	11.1	95	7.6
<b>04-19-2012</b>	<b>1230</b>	Surface water	Regular	752	11	7.8	83	7.2
<b>06-29-2012</b>	<b>0925</b>	<i>QC sample - Artificial</i>	<i>Blank</i>	--	--	--	--	--
<b>06-29-2012</b>	<b>1000</b>	Surface water	Regular	748	2.3	5.2	62	7.0
<b>06-29-2012</b>	<b>1001</b>	<i>QC sample - Surface water</i>	<i>Replicate</i>	748	--	5.0	60	7.0
<b>08-21-2012</b>	<b>1330</b>	Surface water	Regular	751	6.7	7.0	83	7.0

**02085000 ENO RIVER AT HILLSBOROUGH, NC—Continued**

**WATER-QUALITY DATA**  
**WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012**

Part 2 of 6

[%, percent; ANC, acid neutralizing capacity; CaCO<sub>3</sub>, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO<sub>2</sub>, silicon dioxide; ft<sup>3</sup>/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Sample start time	Turbidity, water, unfiltered, broad band light source							
		Specific conduc-	(400-680 nm), detectors at multiple angles	Dissolved solids dried at 180°C, water, filtered,	Calculus, water, filtered,	Magne-	Potassium, water, filtered,	Sodium, water, filtered,	
		water, unfiltered, µS/cm at 25°C (00095)	Tempera- ture, water, °C (00010)	including 90 +/- 30 degrees, ratiometric correction, NTRU (63676)	mg/L (70300)	mg/L (00915)	mg/L (00925)	mg/L (00935)	mg/L (00930)
10-25-2011	1230	112	11.9	--	88	9.36	3.56	2.41	7.25
10-25-2011	1231	--	--	--	97	9.31	3.56	2.48	7.07
10-25-2011	1310	--	--	--	--	< .022	< .011	< .03	< .06
11-29-2011	1145	85	12.4	--	63	5.99	2.40	2.71	6.17
12-19-2011	1115	92	5.5	--	56	7.04	3.05	1.82	6.04
02-01-2012	1130	96	8.3	--	58	7.54	3.04	1.49	6.76
04-19-2012	1230	103	17.6	--	68	8.60	3.63	1.57	6.97
06-29-2012	0925	--	--	--	--	< .022	< .011	< .03	< .06
06-29-2012	1000	122	23.8	--	75	10.5	4.05	1.84	7.80
06-29-2012	1001	122	23.8	--	102	10.5	4.04	1.87	7.85
08-21-2012	1330	61	23.7	6.0	49	7.90	2.91	1.99	6.43

## 02085000 ENO RIVER AT HILLSBOROUGH, NC—Continued

**WATER-QUALITY DATA**  
**WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012**

Part 3 of 6

[%, percent; ANC, acid neutralizing capacity; CaCO<sub>3</sub>, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO<sub>2</sub>, silicon dioxide; ft<sup>3</sup>/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Sample start time	ANC, water, unfiltered, inflection- point, incremental titration method, field, mg/L as CaCO <sub>3</sub> (00419)	Bi- carbonate, water, unfiltered, inflection- point, incremental titration method, field, mg/L (00450)	Chloride, water, filtered, mg/L (00940)	Fluoride, water, filtered, mg/L (00950)	Silica, water, filtered, mg/L as SiO <sub>2</sub> (00955)	Sulfate, water, filtered, mg/L (00945)	Ammonia plus organic nitrogen, water, unfiltered, mg/L as N (00625)	Ammonia, water, filtered, mg/L as N (00608)
10-25-2011	1230	29.7	36.2	8.91	0.08	8.63	6.62	0.34	0.018
10-25-2011	1231	28.7	35.0	9.10	.09	8.69	6.64	.34	.019
10-25-2011	1310	--	--	<.06	<.04	<.018	<.09	<.07	<.010
11-29-2011	1145	22.0	26.9	7.72	<.04	9.16	5.50	.90	<.010
12-19-2011	1115	25.3	30.8	8.64	.04	9.76	6.39	.35	.017
02-01-2012	1130	22.2	27.1	8.55	.04	9.43	6.70	.32	.022
04-19-2012	1230	26.5	32.3	7.20	.05	11.0	6.33	.36	.034
06-29-2012	0925	--	--	<.06	<.04	<.018	<.09	<.07	<.010
06-29-2012	1000	26.1	31.8	7.48	.10	9.58	6.78	.33	.027
06-29-2012	1001	--	--	7.46	.10	9.52	6.78	.31	.027
08-21-2012	1330	27.3	33.2	6.22	.07	8.88	5.13	.44	.027

**WATER-QUALITY DATA**  
**WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012**

Part 4 of 6

[%, percent; ANC, acid neutralizing capacity; CaCO<sub>3</sub>, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO<sub>2</sub>, silicon dioxide; ft<sup>3</sup>/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Sample start time	Nitrate plus nitrite, water, filtered, mg/L as N (00631)	Orthophos- phate, water, filtered, mg/L as P (00671)	Phosphorus, water, unfiltered, mg/L as P (00665)	Aluminum, water, unfiltered, recover- able, µg/L (01105)	Cadmium, water, unfiltered, recover- able, µg/L (01027)	Chromium, water, unfiltered, recover- able, µg/L (01034)	Cobalt, water, unfiltered, recover- able, µg/L (01037)	Copper, water, unfiltered, recover- able, µg/L (01042)
10-25-2011	1230	0.06	0.005	0.026	88.7	<.016	1.1	0.29	1.0
10-25-2011	1231	.06	.006	.026	104	<.016	1.2	.31	1.1
10-25-2011	1310	<.01	<.004	.004	<3.8	<.016	<.30	<.02	<.70
11-29-2011	1145	.10	.022	.176	1,640	.039	1.8	3.6	5.9
12-19-2011	1115	.14	.008	.026	--	--	--	--	--
02-01-2012	1130	.22	.006	.024	--	--	--	--	--
04-19-2012	1230	.19	.006	.022	105	.018	<.30	.32	1.7
06-29-2012	0925	<.01	<.004	<.004	<3.8	<.016	<.30	<.02	<.70
06-29-2012	1000	.09	<.004	.019	--	--	--	--	--
06-29-2012	1001	.10	<.004	.021	--	--	--	--	--
08-21-2012	1330	.19	.011	.036	--	--	--	--	--

## 02085000 ENO RIVER AT HILLSBOROUGH, NC—Continued

**WATER-QUALITY DATA**  
**WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012**

Part 5 of 6

[%, percent; ANC, acid neutralizing capacity; CaCO<sub>3</sub>, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO<sub>2</sub>, silicon dioxide; ft<sup>3</sup>/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Sample start time	Iron, water, unfiltered, recoverable, µg/L (01045)	Lead, water, unfiltered, recoverable, µg/L (01051)	Manganese, water, unfiltered, recoverable, µg/L (01055)	Mercury, water, unfiltered, recoverable, µg/L (71900)	Molybdenum, water, unfiltered, recoverable, µg/L (01062)	Nickel, water, unfiltered, recoverable, µg/L (01067)	Silver, water, unfiltered, recoverable, µg/L (01077)	Zinc, water, unfiltered, recoverable, µg/L (01092)	Arsenic, water, unfiltered, µg/L (01002)
<b>10-25-2011</b>	<b>1230</b>	610	0.23	271	<.005	0.10	0.29	<.015	<3.0	0.62
<b>10-25-2011</b>	<b>1231</b>	618	.24	267	<.005	.10	.29	<.015	<3.0	.70
<b>10-25-2011</b>	<b>1310</b>	5.1	<.04	<.4	<.005	<.05	<.19	<.015	<3.0	<.28
<b>11-29-2011</b>	<b>1145</b>	3,860	3.96	943	.012	.13	1.4	<.015	15.9	1.1
<b>12-19-2011</b>	<b>1115</b>	--	--	--	--	--	--	--	--	--
<b>02-01-2012</b>	<b>1130</b>	--	--	--	--	--	--	--	--	--
<b>04-19-2012</b>	<b>1230</b>	809	.25	96.7	<.005	.09	.50	<.015	<3.0	.37
<b>06-29-2012</b>	<b>0925</b>	<4.6	<.04	<.4	<.005	<.05	<.19	<.015	<3.0	<.28
<b>06-29-2012</b>	<b>1000</b>	--	--	--	--	--	--	--	--	--
<b>06-29-2012</b>	<b>1001</b>	--	--	--	--	--	--	--	--	--
<b>08-21-2012</b>	<b>1330</b>	--	--	--	--	--	--	--	--	--

**WATER-QUALITY DATA**  
**WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012**

Part 6 of 6

[%, percent; ANC, acid neutralizing capacity; CaCO<sub>3</sub>, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO<sub>2</sub>, silicon dioxide; ft<sup>3</sup>/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Sample start time	Selenium, water, unfiltered, µg/L (01147)	Organic carbon, water, unfiltered, mg/L (00680)	Suspended sediment concentration, mg/L (80154)
<b>10-25-2011</b>	<b>1230</b>	0.066	5.9	6
<b>10-25-2011</b>	<b>1231</b>	.063	5.9	7
<b>10-25-2011</b>	<b>1310</b>	<.050	<.5	--
<b>11-29-2011</b>	<b>1145</b>	.133	12.0	167
<b>12-19-2011</b>	<b>1115</b>	--	6.0	15
<b>02-01-2012</b>	<b>1130</b>	--	4.8	6
<b>04-19-2012</b>	<b>1230</b>	.090	5.2	2
<b>06-29-2012</b>	<b>0925</b>	<.050	<.5	--
<b>06-29-2012</b>	<b>1000</b>	--	5.2	--
<b>06-29-2012</b>	<b>1001</b>	--	5.3	--
<b>08-21-2012</b>	<b>1330</b>	--	5.4	4