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December 31, 2009

Mr. Joseph F. LeMay
Remedial Project Manager
US EPA – New England
5 Post Office Square, Suite 100
Mail Code: OSSR07-4
Boston, MA 02109- 3912

**Subject: Industri-plex Operable Unit 2 Superfund Site
Woburn, Massachusetts
Quarterly Storm Flow Surface Water Monitoring Report**

Dear Mr. LeMay:

Pursuant to Paragraph 34 of the Consent Decree (CD)(Civil Action No.1:08-cv-10325) and Section V.A.5 of the Remedial Design / Remedial Action (RD/RA) Statement of Work (SOW) for the above referenced site, enclosed please find the Quarterly Storm Flow Surface Water Monitoring Report No. 3.

This report covers the period from September 1, 2009 to November 30, 2009, and is submitted on behalf of the Settling Defendants.

Also included is a CD containing the Flowlink® data covering this reporting period.

Please contact me if you have any questions.

Sincerely,

Bruce Thompson
Project Coordinator

Enclosure

cc: Jen McWeeney - MassDEP
Settling Defendants
Larry McTiernan – Roux Associates

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**Quarterly Storm Flow Surface Water
Monitoring Report No. 3
(September-November 2009)**

Industri-plex Superfund Site
Operable Unit 2
Woburn, Massachusetts

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Disclaimer: This document is a DRAFT document prepared by the Settling Defendants under a government Consent Decree. This document has not undergone formal review by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP). The opinions, findings, and conclusions expressed are those of the author and not those of the EPA or the MassDEP.

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In accordance with the Surface Water Monitoring Plan (SWMP), this Quarterly Storm Flow Surface Water Monitoring Report has been prepared to summarize the sampling activities performed and the data developed for selected storms occurring during the reporting period (September 1 through November 30, 2009), and to provide a brief discussion of the data. Sampling locations are shown in **Figures 1 and 2**.

Storm Sampling and Related Activities Occurring During the Reporting Period

Storm sampling was conducted for one storm event occurring during the reporting period:

Date(s)	Total Precipitation (inches) ¹
November 14-15, 2009	2.68” - 3.43”

Sampling for the storm was conducted in substantial accordance with the SWMP and included automated collection of aliquots over the duration of the storm. Aliquots were inspected after the end of the storm and composited in equal volumes into a single “storm sample” for each station. Grab samples for benzene analysis were collected manually as soon as possible following the onset of the storm, and measurements of surface water and groundwater elevations using staff gauges and piezometers, respectively, were made when safe to perform.

Station-specific storm statistics—including “indicator” flows² and associated runoff totals, flow-pacing interval, the expected number of aliquots (based on the flow pacing interval), flow and total runoff at termination of sampling, the total number of sample aliquots collected, and the number of aliquots “successfully” collected³—are shown in **Table 1**. The flows shown in **Table 1** are, for all but one station (SW-3-IP), based on the rating curves presented in the Quarterly Storm Flow Surface Water Monitoring Report No. 2 (Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT)^{4,5} or in the

¹ Range indicates precipitation totals for the entire storm event recorded by the rain gauges at the four stations proximal to the HBHA Pond (SW-01-TT, SW-2-IP, SW-3-IP, and SW-02-TT).

² Indicator flows include pre-storm baseflow, peak flow, and flow at 50% and 75% down the falling limb (i.e., after flow had peaked and then decreased by 50% and 75% of the difference in flow between pre-storm baseflow and peak flow).

³ “Successful collection” of an aliquot is defined in Section 3.1 of the SWMP QAPP.

⁴ This report was submitted to EPA on October 30, 2009. The data points defining these rating curves were programmed into the primary Isco units at these stations on November 3 and November 4, 2009.

⁵ For the one storm occurring during the reporting period, flow at station SW-08-TT was based on the US Geological Survey’s data for the co-located Aberjona River gauging station since the area-velocity sensor at this station became dislodged during the storm.

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Multiple Source Groundwater Response Plan (MSGRP) Remedial Investigation Report (Stations SW-03-TT, SW-05-TT through SW-07-TT).⁶ In accordance with the SWMP, flows shown for Station SW-3-IP are based on level and velocity. Charts are provided in **Appendix A** that show the rainfall and surface water velocity, level, and flow (i.e., hydrographs) recorded at each station during the one storm sampled during this reporting period. In each hydrograph, the points in time at which sample aliquots were collected are indicated by downward triangles.⁷ In addition, flow at 50% and 75% down the falling limb is noted on the hydrographs.

Modifications to SWMP Protocols during Reporting Period

Refinements in pre-storm preparation notwithstanding, several equipment malfunctions were experienced during the one storm sampled during the reporting period. The “Storm Narrative” that accompanies the storm charts in **Appendix A** lists the minor modifications to SWMP sampling protocols resulting from these equipment malfunctions.

Post-Storm Maintenance and Monitoring

Following the storm event during which sampling was performed, sample and pump-head tubing was replaced, suction volumes were recalibrated, and post-storm surveying was conducted at each station. In accordance with the SWMP, post-storm surveying included surveying of the area-velocity sensors at each station to determine if any sensor elevations changed significantly as a result of storm-related scouring. In addition, at the Montvale Avenue station (SW-06-TT), surveying of the entire cross-sectional profile of the stream was performed pursuant to the SWMP. Post-storm survey results for the area-velocity sensors are shown in **Table 2**, while the post-storm cross-sectional profile for the Montvale Avenue station is shown in **Figure 3**. As shown in **Table 2**, sensor elevations did not change significantly (i.e. greater than 0.1 foot) except for the Montvale monitoring station; **Figure 3** shows, however, that there were only minor changes to the stream profile at the Montvale Avenue station during the reporting period.

⁶ New rating curves are being developed for stations SW-03-TT and SW-05-TT through SW-07-TT which may change the flow estimates for these stations.

⁷ Not all of the triangles shown are necessarily aliquots included in the composite storm samples. Due to software limitations, in some cases grab samples, samples collected during pump-head tubing calibration, and/or samples otherwise not included as part of the composite are shown. In some cases, the aliquots indicated by the triangles were not successfully collected (e.g., due to disconnected tubing) or were not included in the composite (e.g., if an aliquot was collected after 75% of the falling limb had been reached).

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On three occasions during the reporting period, sampling was triggered at one or more stations but was terminated shortly thereafter due to insufficient precipitation. These events occurred on the following dates:

- October 3, 2009
- October 18, 2009
- October 26, 2009

In accordance with the SWMP, following each of these events, sample and pump-head tubing was replaced and suction volumes were recalibrated at each station that was activated. In addition, any bottles that had been filled with sample aliquots were decontaminated and placed back into the rosette.

Data Generated During the Reporting Period

1. Storm hydrologic data (including precipitation, peak stage, peak velocity, peak flow, and runoff at 75% down the falling limb) for the one storm event occurring during the reporting period are shown in **Tables 3a through 3j**.
2. The ranges of water quality parameters recorded for the one storm event occurring during the reporting period are provided in **Tables 4a through 4j**, along with the water quality measurements recorded during all previous SWMP and, where applicable, “Early Action” storm sampling events.⁸
3. Analytical results⁹ for composite samples collected during the one storm event occurring during the reporting period are provided in **Tables 5a through 5j**, along with validated analytical laboratory results for storm samples collected during the previous SWMP and, where applicable, Early Action sampling events and other previous sampling programs at the site (i.e., the Groundwater and Surface Water Investigation Plan [GSIP] and the MSGRP).

⁸ It has been discovered that due to a software error in Flowlink 5™ all turbidity values collected during the SWMP have been incorrectly reported. These values will be updated after a software revision is completed.

⁹ These results have not yet been validated.

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Data Analysis

Data trends – Benzene, total arsenic, dissolved arsenic, and ammonia concentrations observed in samples collected during the SWMP and previous sampling programs (GSIP, MSGRP, and Early Action) are summarized in box-whisker plots in **Appendix B**. The “boxes” indicate the range within which the central 50% of the results fall (the box edges mark the first and third quartiles and the line dividing the box in two marks the median value), while the “whiskers” show the full range of values reported.¹⁰ Since at least two values are required to construct a “box,” cases where an analyte was detected in only one sample during a particular sampling program are shown as diamonds.

¹⁰ Any statistical outliers have not been determined or identified.

Table 1
Storm Statistics - November 14-15, 2009
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Pre-Storm Baseflow (cfs)	Peak Flow (cfs)	50% Falling Limb (cfs)	Total Runoff at 50% Falling Limb (cf)	75% Falling Limb (cfs)	Total Runoff at 75% Falling Limb (cf)	Flow Pacing ¹ (cf)	Expected Number of Aliquots ²	Flow at Termination of Sampling (cfs)	Total Runoff at Termination of Sampling (cf)	Total Aliquots Collected	Aliquots Successfully Collected ³	Notes
SW-01-TT	0.28	62.66	31.47	1,080,110	15.88	1,241,900	40,000	28 - 32	16.03	1,208,571	30	12	a
SW-2-IP	5.60	26.49	16.04	719,599	10.82	1,866,896	10,000	73 - 188	11.66	1,632,175	156	140	
SW-3-IP	0.00	17.77	8.88	70,258	4.44	70,258	3,500	21 - 21	4.18	70,258	9	9	b
SW-02-TT	2.48	64.42	33.45	3,497,071	17.96	4,575,912	50,000	71 - 93	22.38	4,241,732	80	80	
SW-03-TT	0.16	46.86	23.51	3,434,189	11.84	4,274,335	50,000	70 - 86	12.66	4,172,540	84	84	
SW-04-TT	2.00	50.51	26.25	2,640,602	14.12	3,459,359	50,000	54 - 70	17.08	3,239,521	64	64	
SW-05-TT	12.83	113.84	63.33	11,886,490	38.08	15,373,510	90,000	133 - 172	47.84	13,712,190	137	137	
SW-06-TT	1.41	72.64	37.02	7,952,051	19.22	11,251,110	160,016	51 - 71	19.97	10,720,740	68	50	
SW-07-TT	10.77	197.26	104.01	19,940,830	57.39	22,935,700	255,062	79 - 91	49.38	23,378,590	92	92	
SW-08-TT	4.97	799.29	402.13	192,595,300	203.55	198,231,700	401,042	481 - 495	570.81	107,545,400	240	240	a, c

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

in = inches

cfs = cubic feet per second

ERR = Equipment malfunction (e.g., obstructed rain gauge)

1 Flow Pacing for stations SW-01-TT, SW-02-TT, SW-03-TT, SW-05-TT, SW-06-TT, and SW-07-TT is adapted from the flowing pacing reported by TTNUS in the MSGRP RI Report

2 Expected Number of Aliquots = (flow at 50% falling limb / flow pacing) to (flow at 75% falling limb / flow pacing)

3 Aliquots Successfully Collected represent aliquots collected as defined in the SWMP QAPP (Sec. 3.1)

- Flows reported are not representative because a/v sensor was dislodged. Flows are shown, nevertheless, because flow paced sampling is dictated by measured flows, regardless of accuracy.
- Due to intensity and short duration of the storm, and the current recording interval (i.e., every 5 minutes), several aliquots were missed.
- Total runoff at 75% of the falling limb is the runoff at the point in time at which the a/v sensor was re-set.

The number of aliquots collected is much lower than the expected number of aliquots because flow was terminated at 75% down the falling limb

Table 2
Post-Storm Survey Results for the Area-Velocity Sensors
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station Number	Station Location	Baseline Sensor Elevation ¹	Pre-Storm Sensor Elevation ²	11/18/2009		
				Post-Storm Sensor Elevation	Δ from Pre-Storm Elevation ³	Δ from Initial Elevation
SW-01-TT	Halls Brook	93.20	93.17	NM ³	NA	NA
SW-2-IP	Atlantic Avenue Drainway	92.38	NM	NM	NA	NA
SW-3-IP	BECO Right-of-Way	93.68	93.65	93.66	0.01	-0.02
SW-02-TT	HBHA Pond Outlet	97.82	97.82	97.84	0.02	0.02
SW-03-TT	Aberjona River @ Mishawum Rd.	93.25	93.22	93.22	0.00	-0.03
SW-04-TT	HBHA Wetland Outlet	90.90	NM	90.90	NA	0.00
SW-05-TT	Aberjona River @ Salem Street	94.15	94.13	94.10	-0.03	-0.05
SW-06-TT	Aberjona River @ Montvale Avenue	93.05	93.02	92.85	-0.17	-0.20
SW-07-TT	Aberjona River @ Swanton Street	89.84	89.84	89.89	0.05	0.05
SW-08-TT	Aberjona River @ USGS Gaging Station	91.39	91.39 ⁴	91.40	NA ⁵	0.01

NA = Not applicable

NM = Not measured

- Notes:
1. Baseline sensor elevation is based on initial elevation surveys, unless a/v sensor relocated
 2. Except where indicated, pre-storm elevation is post-storm sensor elevation from latest storm occurring during previous quarter (7/27/09)
 3. Sensor washed out, replaced, and re-surveyed on 11/18/09. This elevation will be used as the baseline elevation for subsequent storms
 4. The sensor at SW-08-TT was moved and re-surveyed on 8/20/09.
 5. Sensor washed out, replaced, and re-surveyed on 11/18/09 to be equivalent with crest of weir

Table 3a
Storm Hydrologic Data for SW-01-TT (Halls Brook)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-01-TT	06/18/09	1.07	1.59	2.27	13.92	974,772
	07/01/09	1.80	2.09	3.76	21.67	1,665,930
	07/07/09	2.87	2.25	4.36	25.42	2,251,596
	07/23/09	3.06	2.69	3.27	33.08	3,940,374
	11/14/09	3.43	ERR	ERR	ERR	ERR

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

in = inches
 ft = feet
 ft/s = feet per second
 cfs = cubic feet per second
 cf = cubic feet

ERR = Equipment malfunction (e.g. sensor was dislodged)

Table 3b
Storm Hydrologic Data for SW-2-IP (Atlantic Avenue Drainway)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-2-IP	06/18/09	0.93	0.67	1.85	9.05	379,752
	07/01/09	1.40	1.12	3.25	26.32	1,129,314
	07/07/09	2.32	1.62	3.59	41.07	626,764
	07/23/09	2.23	1.05	3.30	24.94	1,145,352
	11/14/09	2.68	1.12	3.39	26.49	1,866,896

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

AAD = Atlantic Avenue Drainway

in = inches

ft = feet

ft/s = feet per second

cfs = cubic feet per second

cf = cubic feet

Table 3c
Storm Hydrologic Data for SW-3-IP (Boston Edison Co. ROW)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-3-IP	06/18/09	0.94	0.77	1.30	4.63	104,821
	07/01/09	1.46	1.39	1.75	14.97	170,540
	07/07/09	2.35	2.07	2.30	35.13	111,560
	07/23/09	2.37	2.19	1.82	12.14	193,146
	11/14/09	2.69	2.31	1.94	17.77	70,258

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

BECO ROW = Boston Edison Company Right-of-Way

in = inches

ft = feet

ft/s = feet per second

cfs = cubic feet per second

cf = cubic feet

Table 3d
Storm Hydrologic Data for SW-02-TT (HBHA Pond Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-02-TT	06/18/09	1.12	1.87	0.78	17.67	1,743,147
	07/01/09	ERR	2.42	1.43	26.85	3,248,161
	07/07/09	ERR	2.78	1.84	32.84	4,415,681
	07/23/09	2.54	3.27	1.55	40.94	3,948,374
	11/14/09	2.94	3.44	ERR	64.42	4,575,912

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

HBHA = Halls Brook Holding Area

in = inches

ft = feet

ft/s = feet per second

cfs = cubic feet per second

cf = cubic feet

ERR = Equipment malfunction

Table 3e
Storm Hydrologic Data for SW-03-TT (Aberjona)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-03-TT	06/18/09	0.91	1.58	1.78	14.37	1,239,944
	07/01/09	1.64	2.44	2.55	27.96	2,294,982
	07/07/09	2.53	3.10	3.03	38.39	2,499,196
	07/23/09	2.53	3.43	2.76	43.52	4,066,986
	11/14/09	2.80	3.64	2.74	46.86	4,274,335

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

in = inches
 ft = feet
 ft/s = feet per second
 cfs = cubic feet per second
 cf = cubic feet

Table 3f
Storm Hydrologic Data for SW-04-TT (HBHA Wetland Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-04-TT	06/18/09	0.95	1.43	3.92	10.42	1,550,883
	07/01/09	1.60	1.78	5.12	13.23	2,281,206
	07/07/09	2.48	2.20	5.55	17.60	2,441,779
	07/23/09	2.40	2.57	6.84	21.02	2,370,051
	11/14/09	2.94	2.58	6.97	50.51	3,459,359

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

in = inches
 ft = feet
 ft/s = feet per second
 cfs = cubic feet per second
 cf = cubic feet

Table 3g
Storm Hydrologic Data for SW-05-TT (Salem Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-05-TT	06/18/09	Data Loss due to Isco Failure				
	07/01/09	1.87	2.45	2.24	72.72	9,737,499
	07/07/09	1.35	2.83	2.76	92.22	11,053,420
	07/23/09	3.28	3.05	3.23	102.98	11,611,000
	11/14/09	3.04	3.26	2.84	113.84	15,373,510

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

in = inches
ft = feet
ft/s = feet per second
cfs = cubic feet per second
cf = cubic feet

Table 3h
Storm Hydrologic Data for SW-06-TT (Montvale Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-06-TT	06/18/09	0.94	2.78	1.40	30.67	4,222,181
	07/01/09	ERR	3.86	2.10	52.56	5,950,627
	07/07/09	ERR	3.99	2.19	55.19	6,953,697
	07/23/09	1.73	4.52	2.47	65.74	8,013,981
	11/14/09	ERR	4.86	2.62	72.64	11,251,110

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

in = inches
 ft = feet
 ft/s = feet per second
 cfs = cubic feet per second
 cf = cubic feet

ERR = Equipment malfunction (e.g. obstructed rain gauge)

Table 3i
Storm Hydrologic Data for SW-07-TT (Swanton Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage (ft)	Peak Velocity ¹ (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-07-TT	06/18/09	1.04	2.15	4.11	82.67	7,087,030
	07/01/09	1.70	3.83	5.40	200.44	16,890,270
	07/07/09	0.77	3.32	4.49	164.87	26,349,860
	07/23/09	Data Loss due to Isco Failure				
	11/14/09	2.64	3.78	5.04	197.26	22,935,700

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 Due to "noise," Peak Velocity value is approximated.

in = inches
 ft = feet
 ft/s = feet per second
 cfs = cubic feet per second
 cf = cubic feet

Table 3j
Storm Hydrologic Data for SW-08-TT (USGS / Mystic Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station	Date	Precipitation (in)	Peak Stage ¹ (ft)	Peak Velocity ² (ft/s)	Peak Flow (cfs)	Total Runoff at 75% Falling Limb (cf)
SW-08-TT	06/18/09	0.55	3.08	1.05	202.28	39,070,400
	07/01/09	ERR	4.12	2.12	315.40	104,879,300
	07/07/09	ERR	3.62	1.96	261.03	75,114,590
	07/23/09	2.22	4.05	2.65	306.76	41,933,140
	11/14/09	2.20	12.43 ³	ERR	293.00 ³	43,714,260 ³

Notes:

- For Stations SW-01-TT, SW-2-IP, SW-02-TT, SW-04-TT, and SW-08-TT, flows shown are based on the rating curves reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- For Stations SW-03-TT, and SW-05-TT through SW-07-TT, flows shown are based on the rating curves reported by TTNUS in the MSGRP RI Report. New rating curves are being developed which may change the flow estimates for these stations.
- Flows shown for station SW-3-IP was estimated based on level and velocity.

1 For storms measured in June and July 2009, stage datum is the stream bed. For the November 14, 2009 storm, stage datum is Mean Sea Level.

2 Due to "noise," Peak Velocity value is approximated.

3 Flow (i.e. 75%) estimates are based on data obtained from USGS station 01102500 - Aberjona River at Winchester, MA. For stage, there is a 10.02 foot offset.

in = inches

ft = feet

ft/s = feet per second

cfs = cubic feet per second

cf = cubic feet

ERR = Equipment malfunction (e.g. obstructed rain gauge, AV sensor dislodged)

Table 4a
Ranges of Storm Flow Water Quality Parameters for SW-01-TT (Halls Brook)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-01-TT	12/11/08 - 12/14/08	1.2 - 4.6	9.8 - 12.2	6.4 - 6.7	503.4 - 556.6	784 - 1,854	22.6 - 2,874
Surface Water Monitoring Plan							
SW-01-TT	06/18/09 - 06/19/09	15.4 - 17.3	5.6 - 8.5	6.7 - 6.9	190.1 - 225.9	276 - 650	Data unrecoverable
	07/01/09 - 07/03/09	15.3 - 17.0	Data unrecoverable	6.6 - 6.9	403.5 - 564.0	170 - 660	NR
	07/07/09 - 07/09/09	15.1 - 17.8	Data unrecoverable	6.6 - 7.1	382.4 - 535.8	94 - 516	NR
	07/24/09 - 07/26/09	16.8 - 20.5	Data unrecoverable	6.3 - 6.9	392.5 - 471.7	158 - 548	NR
	11/14/09 - 11/16/09	9.7 - 10.0	7.9 - 9.2	6.5 - 6.8	449.8 - 476.0	154 - 268	NR

Notes:

HBHA = Halls Brook Holding Area

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Turbidity data for 7/1-2/09 and dissolved oxygen data for 7/1-2/09, 7/7-8/09 and 7/23-24/09 storms unrecoverable due to Isco 6712 transmission errors.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4b
Ranges of Storm Flow Water Quality Parameters for SW-2-IP (AAD)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-2-IP	12/14/08 - 12/14/08	0.4 - 1.3	10.7 - 11.5	6.5 - 6.5	470.3 - 480.1	240 - 242	3.6 - 4.4
Surface Water Monitoring Plan							
SW-2-IP	06/18/09 - 06/20/09	17.6 - 21.8	4.3 - 6.8	6.8 - 7.1	395.1 - 470.1	174 - 536	NR
	07/01/09 - 07/03/09	16.8 - 18.8	4.0 - 7.9	6.7 - 6.9	379.0 - 489.0	74 - 546	NR
	07/07/09 - 07/09/09	17.3 - 19.8	4.1 - 9.0	6.7 - 7.2	371.3 - 476.1	60 - 518	NR
	07/23/09 - 07/25/09	17.8 - 24.9	4.6 - 9.1	6.6 - 7.0	366.8 - 428.3	46 - 430	NR
	11/14/09 - 11/15/09	9.1 - 11.0	8.0 - 11.0	6.8 - 7.1	387.4 - 424.5	74 - 600	NR

Notes:

AAD = Atlantic Avenue Drainway

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4c
Ranges of Storm Flow Water Quality Parameters for SW-3-IP (BECO ROW)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-3-IP	12/11/08 - 12/13/08	-1.6 - 6.5	NM - 12.5	NM - 4.3	-323.1 - 507.8	-20 - 586	NM - 19.6
Surface Water Monitoring Plan							
SW-3-IP	06/18/09 - 06/19/09	16.4 - 20.4	2.1 - 3.9	6.4 - 6.7	441.2 - 522.3	22 - 86	NR
	07/01/09 - 07/03/09	Data rejected					
	07/07/09 - 07/09/09						
	07/24/09 - 07/24/09						
	11/14/09 - 11/14/09	10.6 - 10.7	9.8 - 10.4	6.3 - 6.7	86.0 - 112.1	16 - 128	NR

Notes:

BECO ROW = Boston Edison Company right-of-way

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Water quality parameter data for 7/1-2/09, 7/7-8/09 and 7/23-24/09 storms were reviewed and rejected due to problems associated with the dry conditions that existed prior to the storms.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4d
Ranges of Storm Flow Water Quality Parameters for SW-02-TT (HBHA Pond Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Duration	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"								
SW-02-TT	12/14/08 - 12/14/08	12:00:00	1.5 - 2.3	10.0 - 10.2	6.3 - 6.4	524.3 - 527.3	416 - 470	22.6 - 23.3
Surface Water Monitoring Plan								
SW-02-TT	06/18/09 - 06/20/09	49:30:00	16.2 - 21.0	5.4 - 6.8	6.1 - 6.3	360.7 - 423.3	474 - 750	NR
	07/01/09 - 07/03/09	39:26:00	16.0 - 17.7	3.4 - 5.7	6.3 - 6.5	248.1 - 532.9	484 - 890	NR
	07/07/09 - 07/09/09	40:27:00	15.8 - 17.4	1.2 - 6.2	6.0 - 6.1	190.8 - 499.4	282 - 902	NR
	07/24/09 - 07/26/09	49:00:00	17.2 - 20.1	2.6 - 7.5	6.3 - 6.6	182.3 - 471.8	234 - 964	NR
	11/14/09 - 11/15/09	27:31:00	9.3 - 11.2	5.8 - 7.6	6.3 - 6.6	270.0 - 481.3	248 - 880	NR

Notes:

HBHA = Halls Brook Holding Area

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4e
Ranges of Storm Flow Water Quality Parameters for SW-03-TT (Aberjona River)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-03-TT	06/19/09 - 06/20/09	16.9 - 19.6	4.1 - 5.4	6.1 - 6.3	315.0 - 410.3	256 - 688	NR
	07/01/09 - 07/03/09	16.3 - 18.1	5.4 - 8.3	6.5 - 6.7	391.4 - 549.0	226 - 824	NR
	07/07/09 - 07/09/09	15.5 - 18.1	5.4 - 9.5	5.8 - 6.5	412.5 - 550.0	46 - 582	NR
	07/24/09 - 07/26/09	17.9 - 21.4	4.1 - 8.6	6.6 - 6.8	425.9 - 509.3	148 - 782	NR
	11/14/09 - 11/15/09	10.2 - 11.4	6.4 - 9.3	6.1 - 6.7	469.6 - 512.6	88 - 494	NR

Notes:

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4f
Ranges of Storm Flow Water Quality Parameters for SW-04-TT (HBHA Wetland Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)	
Remedial Design "Early Action"								
SW-04-TT	12/14/08 - 12/14/08	1.8 - 2.2	9.7 - 9.8	5.9 - 5.9	373.6 - 374.1	390 - 428	0 - 0	
Surface Water Monitoring Plan								
SW-04-TT	06/18/09 - 06/19/09	16.7 - 21.9	5.1 - 7.9	6.5 - 6.7	218.0 - 317.2	358 - 754	NR	
	07/01/09 - 07/03/09	16.1 - 18.2	4.6 - 7.8	6.4 - 6.8	237.0 - 347.6	242 - 802	NR	
	07/07/09 - 07/09/09	15.7 - 19.3	4.9 - 9.4	6.1 - 6.9	231.7 - 418.4	38 - 728	NR	
	07/24/09 - 07/26/09	Data rejected						
	11/14/09 - 11/15/09	10.5 - 11.6	6.5 - 9.9	6.5 - 6.8	177.8 - 331.6	72 - 424	NR	

Notes:

HBHA = Halls Brook Holding Area

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4g
Ranges of Storm Flow Water Quality Parameters for SW-05-TT (Salem Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-05-TT	06/18/09 - 06/18/09	Data lost due to Isco 6712 malfunction					
	07/01/09 - 07/02/09	16.5 - 17.9	3.3 - 6.7	6.3 - 6.7	441.6 - 530.5	402 - 1,072	NR
	07/07/09 - 07/09/09	16.5 - 17.6	4.0 - 6.5	6.1 - 6.4	507.5 - 544.2	292 - 670	NR
	07/24/09 - 07/26/09	17.6 - 24.0	2.5 - 7.3	6.2 - 6.6	441.1 - 496.7	264 - 1,022	NR
	11/14/09 - 11/16/09	6.3 - 7.0	ERR	ERR	10.1 - 11.6	10 - 2,866	NR

Notes:

HBHA = Halls Brook Holding Area

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

ERR = Equipment malfunction (i.e., sensors suspected to have been damaged from debris)

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4h
Ranges of Storm Flow Water Quality Parameters for SW-06-TT (Montvale Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-06-TT	06/19/09 - 06/20/09	16.5 - 18.3	7.0 - 7.3	6.7 - 6.8	429.8 - 454.7	Data unrecoverable	NR
	07/01/09 - 07/03/09	16.1 - 17.7	5.8 - 7.5	6.4 - 6.8	401.0 - 525.8	338 - 772	NR
	07/07/09 - 07/09/09	16.0 - 18.5	6.7 - 8.4	6.5 - 7.0	374.5 - 523.4	178 - 654	NR
	07/24/09 - 07/26/09	17.4 - 21.5	5.7 - 7.7	6.5 - 6.8	456.6 - 514.1	174 - 418	NR
	11/14/09 - 11/17/09	8.3 - 11.9	5.7 - 6.7	6.6 - 6.8	453.7 - 487.7	346 - 548	NR

Notes:

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Specific conductance data for 6/18-19/09 storm unrecoverable due Isco 6712 transmission errors.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4i
Ranges of Storm Flow Water Quality Parameters for SW-07-TT (Swanton Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-07-TT	06/19/09 - 06/19/09	16.5 - 17.9	6.6 - 7.9	6.5 - 6.8	458.5 - 489.9	432 - 1,402	NR
	07/01/09 - 07/02/09	16.4 - 17.7	6.3 - 7.8	5.6 - 5.9	449.1 - 494.8	58 - 928	NR
	07/07/09 - 07/09/09	16.2 - 18.0	6.3 - 7.7	6.4 - 6.9	389.6 - 503.9	258 - 1,056	NR
	07/24/09 - 07/26/09	17.9 - 20.9	6.0 - 6.7	6.5 - 6.8	482.7 - 506.6	496 - 726	NR
	11/14/09 - 11/16/09	9.8 - 10.8	6.9 - 8.4	7.2 - 7.3	63.6 - 95.3	718 - 1,120	NR

Notes:

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 4j
Ranges of Storm Flow Water Quality Parameters for SW-08-TT (USGS / Mystic Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-08-TT	06/18/09 - 06/20/09	16.9 - 18.7	5.7 - 7.1	6.4 - 6.6	470.9 - 525.3	490 - 976	NR
	07/01/09 - 07/03/09	16.8 - 18.3	4.4 - 8.7	6.8 - 7.1	443.1 - 509.7	358 - 938	NR
	07/07/09 - 07/11/09	17.7 - 20.9	5.3 - 8.0	7.0 - 7.3	361.4 - 508.1	506 - 1,002	NR
	07/24/09 - 07/26/09	18.2 - 22.6	1.8 - 8.1	7.0 - 7.8	360.3 - 488.8	352 - 1,044	NR
	11/14/09 - 11/16/09	9.3 - 11.5	2.7 - 10.5	6.9 - 7.2	387.3 - 463.5	184 - 942	NR

Notes:

USGS = United States Geological Survey

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NR = Not recorded. Due to a software error in Flowlink 5™, turbidity values have been incorrectly recorded. These values will be updated following a software revision.

Ranges reported are for periods of time over which aliquots used in composite sample were collected.

Table 5a
Storm Flow Laboratory Analytical Results for SW-01-TT (Halls Brook)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan												
SW-1	09/04/00	--	0.0028B	0.002U	--	--	5U	--	--	--	--	--
	09/18/00	--	0.0044B	0.0025U	--	--	5U	--	--	--	--	--
	10/09/00	--	0.0025U	0.0025U	--	--	5U	--	--	--	--	--
	10/19/00	--	0.0062B	0.005U	--	--	25.5	--	--	--	--	--
	12/18/00	--	0.0063B	0.0035U	--	--	13.6	--	--	--	--	--
	03/23/01	--	0.0036J	0.0035U	--	--	62.8	--	--	--	--	--
	03/29/01	--	0.0024U	0.0042U	--	--	5.2	--	--	--	--	--
Multiple Source Groundwater Response Plan												
SW-01-TT	04/26/02	--	0.0051	0.002U	2.76	0.327	31.2J	--	--	--	--	--
	05/15/02	--	0.0018J	0.002U	1.23	0.447	25.8J	--	--	--	--	--
	07/25/02	--	0.0036	0.0013U	1.94	0.226J	22.1J	--	--	--	--	--
	08/31/02	--	0.0057U	0.0039UJ	1.65	0.0573U	15.8J	--	--	--	--	--
	09/25/02	--	0.0022J	0.0025U	1.68	0.203	21.4J	--	--	--	--	--
		10/18/02	--	0.0042J	0.003U	2.06	0.0818U	20.4	--	--	--	--
Remedial Design "Early Action"												
SW-01-TT	12/15/08	--	0.005	0.003U	--	--	30	0.61	0.05U	0.71	1.8	1.2
Surface Water Monitoring Plan												
SW-01-TT	06/20/09	0.5U	0.003U	0.003U	1.5	0.34	6.9	0.992	0.12	0.96	1.7	0.71
	06/20/09A	--	0.0028J	0.003U	1.6	0.29	20	1.24	0.11	0.54	2	0.76
	07/03/09	0.5U	0.0027J	0.003U	3.1	0.6	16	1.01	0.05	0.49	0.98	0.3U
	07/09/09	0.5U	0.003U	0.003U	1.4	0.51	23	0.667	0.08	0.53	1.5	0.83
	07/26/09	0.5U	0.0027J	0.003U	1.3	0.31	7.3	0.0654J	0.05U	0.1	0.55	0.55
		11/16/09*	0.5U	0.008	0.003U	5.6	0.3	130	0.474	0.05U	0.31	1.9

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown.

* Not yet validated

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

B = Compound detected in laboratory blank

Table 5b
Storm Flow Laboratory Analytical Results for SW-2-IP (Atlantic Avenue Drainway)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Wa												
SW-2	09/04/00	--	0.002U	0.002U	--	--	5U	--	--	--	--	--
	09/18/00	--	0.0025U	0.0025U	--	--	5U	--	--	--	--	--
	10/09/00	--	0.0025U	0.0025U	--	--	5U	--	--	--	--	--
	10/19/00	--	0.0036B	0.0025U	--	--	12	--	--	--	--	--
	12/18/00	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/23/01	--	0.0035U	0.0035U	--	--	21.6	--	--	--	--	--
	03/29/01	--	0.0025B	0.0042U	--	--	14	--	--	--	--	--
Remedial Design "Early Action"												
SW-2-IP	12/15/08	--	0.003U	0.003U	--	--	5U	0.229	0.05U	0.22U	0.54	0.31
Surface Water Monitoring Plan												
SW-2-IP	06/20/09	0.5U	0.003	0.003	1.3	0.06	6.3	0.086	0.08	0.27	0.76	0.67
	07/03/06	0.5U	0.003U	0.003U	1.8	0.34	14	0.187	0.05U	0.28	0.68	0.49
	07/09/09	0.5U	0.003U	0.003U	1.7	0.28	7.9	0.123	0.06	0.43	0.5	0.38
	07/26/09	0.5U	0.0028J	0.003U	1.2	0.38	12	0.613	0.028J	0.34	1.2	0.59
	11/16/09*	0.5U	0.003U	0.003U	0.94	0.11	5.1	0.072J	0.05U	0.36	0.42	0.42

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown.

* Not yet validated

AAD = Atlantic Avenue Drainway

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

B = Compound detected in laboratory blank

NS = Not Sampled

Table 5c
Storm Flow Laboratory Analytical Results for SW-3-IP (Boston Edison Co. ROW)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan												
SW-3	09/04/00	--	0.0058B	0.0057B	--	--	5U	--	--	--	--	--
	09/18/00	--	0.0102	0.0037B	--	--	5U	--	--	--	--	--
	10/09/00	--	0.0084B	0.0025U	--	--	5U	--	--	--	--	--
	10/19/00	--	0.0122	0.0093B	--	--	5	--	--	--	--	--
	03/23/01	--	0.022	0.0106	--	--	35.6	--	--	--	--	--
	03/29/01	--	0.0763	--	--	--	55.6	--	--	--	--	--
Remedial Design "Early Action"												
SW-3-IP	12/15/08	--	0.0024J	0.003U	--	--	15	0.246	0.05U	0.16U	0.59	0.34
Surface Water Monitoring Plan												
SW-3-IP	06/20/09	0.5U	0.024	0.004	1.8	0.06	29	0.759	0.1	0.46	1.2	0.44
	07/03/09	0.5U	0.036	0.004	3.6	0.16	58	1.27	0.05U	0.39	1.8	0.53
	07/09/09	0.5U	0.045	0.003U	5.8	0.046J	60	0.22	0.05U	0.32	0.59	0.37
	07/26/09	0.5U	0.004	0.0028J	0.35	0.05	5U	0.231	0.05U	0.1U	0.34	0.3U
	11/16/09*	0.5U	0.05	0.0029J	1.3	1.3	5.91	0.412	0.05U	0.19	1.3	0.89

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown.

* Not yet validated

BECO ROW = Boston Edison Company Right-of-Way

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

B = Compound detected in laboratory blank

Table 5d
Storm Flow Laboratory Analytical Results for SW-02-TT (HBHA Pond Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan												
SW-4A	09/18/00	--	0.055	0.0034J	5.66	--	20	--	--	--	--	--
SW-4B	09/18/00	--	0.0452	0.0025U	5.01	--	18.5	--	--	--	--	--
SW-4A	10/09/00	--	0.01	0.0025U	0.8	--	5U	--	--	--	--	--
SW-4	10/19/00	--	0.0305	0.0108	2.52	--	7.5	--	--	--	--	--
	03/29/01	--	0.006J	0.0071J	0.881UJ	--	7.2	--	--	--	--	--
Multiple Source Groundwater Response Plan												
SW-02-TT	04/26/02	--	0.0217	0.008	2.24	0.56	8.8J	--	--	--	--	--
	05/15/02	--	0.0815	0.0274	5.28	1.28	15.5J	--	--	--	--	--
	07/25/02	--	0.0205	0.0037	2.06	0.138U	6J	--	--	--	--	--
	08/31/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/25/02	--	0.037	0.0038J	3.47	0.0391	7.6J	--	--	--	--	--
	10/18/02	--	0.0774	0.0083	6.52	0.297	23.6	--	--	--	--	--
Remedial Design "Early Action"												
SW-02-TT	12/15/08	--	0.012	0.008	--	--	5U	2.95	0.05U	0.58	3.7	0.75
Surface Water Monitoring Plan												
SW-02-TT	06/20/09	0.66	--	--	--	--	--	--	--	--	--	--
	07/03/09	0.5U	0.027	0.011	3.2	1.3	9.2	8.47	0.07	0.51	9.2	0.73
	07/09/09	0.0047	0.019	0.009	2.8	1.3	9.5	4.43	0.1	0.68	5	0.57
	07/26/09	0.0017	0.015	0.009	1.6	0.67	5U	3.15	0.037J	0.3	4	0.85
	11/16/09*	9.1	0.008	0.009	5.3	0.04J	300	5.91	0.05U	0.38	6.9	0.99

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown.

* Not yet validated

HBHA = Halls Brook Holding Area

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

NS = Not Sampled

Table 5e
Storm Flow Laboratory Analytical Results for SW-03-TT (Aberjona)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan												
SW-03-TT	04/26/02	--	0.0121	0.002U	1.93	0.307	--	--	--	--	--	--
	05/15/02	--	0.0075	0.002U	1.44	0.404	5UJ	--	--	--	--	--
	07/25/02	--	0.0117	0.0041	1.32	0.143	7J	--	--	--	--	--
	08/31/02	--	0.0195	0.0037UJ	1.73	0.14U	8.8J	--	--	--	--	--
	09/25/02	--	0.0122	0.004J	1.44	0.335	5.2J	--	--	--	--	--
	10/18/02	--	0.0284	0.003U	3.14	0.0721U	17.2	--	--	--	--	--
Surface Water Monitoring Plan												
SW-03-TT	06/20/09	0.5U	0.006	0.005	--	--	6.6	0.312	0.12	0.57	0.83	0.52
	07/03/09	0.5U	0.005	0.003U	--	--	18	0.249	0.08	0.58	1	0.75
	07/09/09	0.5U	0.004	0.003U	--	--	22	0.241	0.09	0.6	0.93	0.69
	07/26/09	0.5U	0.004	0.0029J	--	--	5U	0.256	0.07	0.75	0.75	0.49
	11/16/09*	0.5U	0.009	0.003U	--	--	16	0.134	0.05U	0.36	0.69	0.56

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown

* Not yet validated

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

Table 5f
Storm Flow Laboratory Analytical Results for SW-04-TT (HBHA Wetland Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan												
SW-9	09/18/00	--	0.0215	0.0028J	1.73	--	7	--	--	--	--	--
	10/09/00	--	0.0093	0.0025U	1.14	--	5	--	--	--	--	--
	10/19/00	--	0.0194	0.0108	1.9	--	5U	--	--	--	--	--
	12/18/00	--	0.009	0.0039J	1.5	--	5U	--	--	--	--	--
	03/23/01	--	0.0142	0.0086	1.49	--	7.2	--	--	--	--	--
	03/29/01	--	0.0072	0.0042U	1.18UJ	--	14.4	--	--	--	--	--
SW-9A	03/23/01	--	0.0035U	--	--	--	5	--	--	--	--	--
Multiple Source Groundwater Response Plan												
SW-04-TT	04/26/02	--	0.0117	0.0059	1.49	0.419	6	--	--	--	--	--
	05/16/02	--	0.0115	0.0049	2.28	0.694	7J	--	--	--	--	--
	07/25/02	--	0.0268	0.0059	2.59	--	20.8J	--	--	--	--	--
	08/06/02	--	0.0368	0.009	3.8	0.0791U	13.6J	--	--	--	--	--
	08/31/02	--	0.029	0.0044UJ	3	0.0276U	15.2J	--	--	--	--	--
	09/25/02	--	0.0253	0.0074	3.06	0.569	10.8J	--	--	--	--	--
	10/18/02	--	0.0478	0.0141	4.6	1.14	15.6	--	--	--	--	--
Remedial Design "Early Action"												
SW-04-TT	12/15/08	--	0.011	0.005	--	--	5.5	2.46	0.05U	0.48	3.1	0.64
Surface Water Monitoring Plan												
SW-04-TT	06/20/09	0.36J	0.016	0.003	--	--	5.5	3.95	0.12	0.58	4.5	0.55
	06/20/09A	--	0.014	0.007	1.9	0.72	14	2.74	0.12	0.53	3.3	0.56
	07/03/09	0.5U	0.02	0.008	--	--	9.5	5.84	0.1	0.71	6.9	1.1
	07/09/09	0.5U	0.016	0.008	--	--	7.3	3.55	0.14	0.55	4.2	0.65
	07/26/09	0.5U	0.011	0.005	--	--	5U	2.38	0.06	0.41	3	0.62
	11/16/09*	1.9	0.017	0.008	--	--	5.9	5.79	0.05U	0.4	6.4	0.61

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown

* Not yet validated

HBHA = Halls Brook Holding Area

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

Table 5g
Storm Flow Laboratory Analytical Results for SW-05-TT (Salem Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan												
SW-05-TT	04/26/02	--	0.015	0.0022J	2.09	0.356	15.7	--	--	--	--	--
	05/15/02	--	0.0233	0.0126	2.21	0.968	8J	--	--	--	--	--
	07/25/02	--	0.0175	0.0023J	1.85	0.129	4.4J	--	--	--	--	--
	08/31/02	--	0.0126	0.0025U	1.16	0.0884U	3J	--	--	--	--	--
	09/25/02	--	0.0115	0.0025U	1.15	0.0607	3.6J	--	--	--	--	--
	10/18/02	--	0.012	0.003U	1.46	0.244	6.8	--	--	--	--	--
Surface Water Monitoring Plan												
SW-05-TT	06/20/09	0.5U	0.01	0.004	--	--	8	0.801	0.13	0.67	1.6	0.8
	07/03/09	0.5U	0.008	0.004	--	--	10	1.13	0.11	0.65	1.8	0.67
	07/09/09	0.5U	0.008	0.007	--	--	5U	1.65	0.18	0.76	2.3	0.65
	07/26/09	0.5U	0.006	0.005	--	--	5U	0.423	0.07	0.7	0.93	0.51
	11/16/09*	0.5U	0.01	0.006	--	--	5U	1.94	0.028J	0.56	2.6	0.66

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown

* Not yet validated

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

Table 5h
Storm Flow Laboratory Analytical Results for SW-06-TT (Montvale Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan												
SW-06-TT	04/26/02	--	0.0168	0.0034J	3.01	0.595	30.4	--	--	--	--	--
	05/15/02	--	0.0212	0.0118	2.15	0.79	11.5J	--	--	--	--	--
	07/25/02	--	0.0152	0.0025J	1.92	0.116U	8J	--	--	--	--	--
	08/31/02	--	0.0152	0.0025U	1.54	0.0919U	9.2J	--	--	--	--	--
	09/25/02	--	0.0255	0.0038J	2.77	0.211	18.6J	--	--	--	--	--
	10/18/02	--	0.0255	0.0026J	3.4	0.378	27.8	--	--	--	--	--
Surface Water Monitoring Plan												
SW-06-TT	06/20/09	0.5U	0.011	0.004	--	--	9.4	0.993	0.16	0.74	1.5	0.51
	07/03/09	0.5U	0.009	0.0022J	--	--	54	1.2	0.09	1	1.9	0.7
	07/09/09	0.5U	0.009	0.004	--	--	7.5	1.15	0.14	0.82	1.8	0.65
	07/26/09	0.5U	0.007	0.004	--	--	5U	0.695	0.06	0.62	1.2	0.5
	11/16/09*	0.5U	0.014	0.003	--	--	18	1.57	0.027J	0.62	2.2	0.63

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown

* Not yet validated

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

Table 5i
Storm Flow Laboratory Analytical Results for SW-07-TT (Swanton Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan												
SW-07-TT	04/26/02	--	0.0117	0.002U	2.52	0.165	33.2	--	--	--	--	--
	05/15/02	--	0.0181	0.0077	1.93J	0.722	9J	--	--	--	--	--
	07/25/02	--	0.0053	0.0014J	0.91	0.0742J	6.1J	--	--	--	--	--
	08/31/02	--	0.0048J	0.0025U	0.777	0.0495U	6J	--	--	--	--	--
	09/25/02	--	0.0072	0.0032	0.88	0.206	4J	--	--	--	--	--
	10/18/02	--	0.0112	0.0036J	1.66	0.224	5.4	--	--	--	--	--
Surface Water Monitoring Plan												
SW-07-TT	06/20/09	0.5U	0.009	0.004	--	--	23	0.573	0.15	0.8	1.2	0.63
	07/03/09	0.5U	0.012	0.003U	--	--	130	0.419	0.08	0.83	1.4	0.98
	07/09/09	0.5U	0.009	0.004	--	--	15	0.949	0.13	0.88	1.75	0.75
	07/24/09	0.5U	0.007	0.0026J	--	--	9.5	0.539	0.07	0.71	1.1	0.56
	11/16/09*	0.5U	0.008	0.003	--	--	13	1.13	0.05U	0.62	1.8	0.67

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown

* Not yet validated

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

Table 5j
Storm Flow Laboratory Analytical Results for SW-08-TT (USGS / Mystic Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Benzene ¹ (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan												
SW-08-TT	04/26/02	--	0.0095	0.002U	1.17	0.24	17.3	--	--	--	--	--
	05/16/02	--	0.0073	0.0031J	6.94	0.364	143J	--	--	--	--	--
	07/25/02	--	0.0046	0.0013U	0.512	0.0087U	15.9J	--	--	--	--	--
	08/31/02	--	0.0055	0.0025U	1.54	0.0655U	16.2J	--	--	--	--	--
	09/25/02	--	0.008	0.0026	4.59	0.226	12.5J	--	--	--	--	--
	10/18/02	--	0.003U	0.003U	1.52	0.469	179	--	--	--	--	--
Surface Water Monitoring Plan												
SW-08-TT	06/20/09	0.5U	0.008	0.004	--	--	18	0.413	0.11	0.79	1	0.59
	07/03/09	0.5U	0.006	0.003U	--	--	29	0.462	0.09	0.82	1.5	1
	07/11/09	0.5U	0.003	0.004	--	--	13	0.229	0.07	0.78	0.98	0.75
	07/26/09	0.5U	0.005	0.0025J	--	--	9.4	0.288	0.05	0.65	1.2	0.91
	11/16/09*	0.5U	0.006	0.003	--	--	15	0.548	0.026J	0.55	1.4	0.85

Notes:

1 For the Surface Water Monitoring Plan, benzene samples are typically collected the day before the date shown

* Not yet validated

µg/l = micrograms per liter

mg/l = milligrams per liter

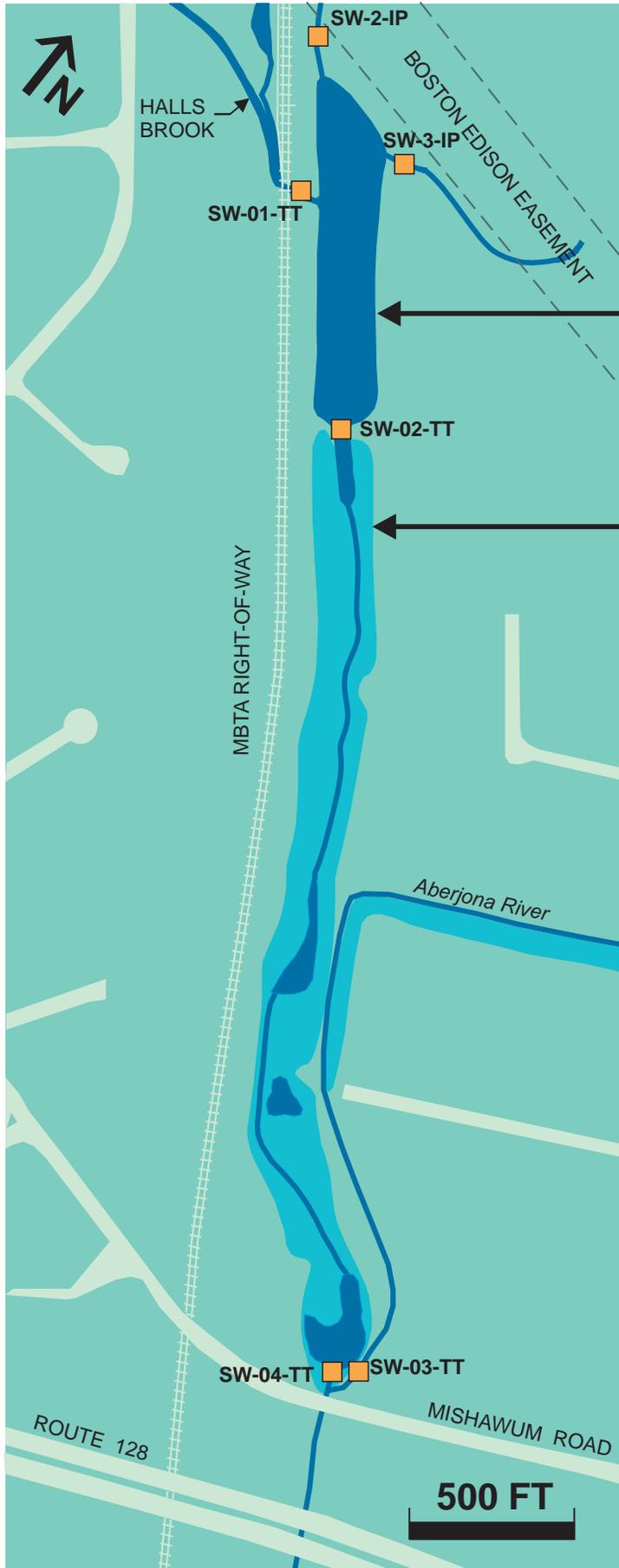
TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated



HBHA POND

HBHA WETLAND

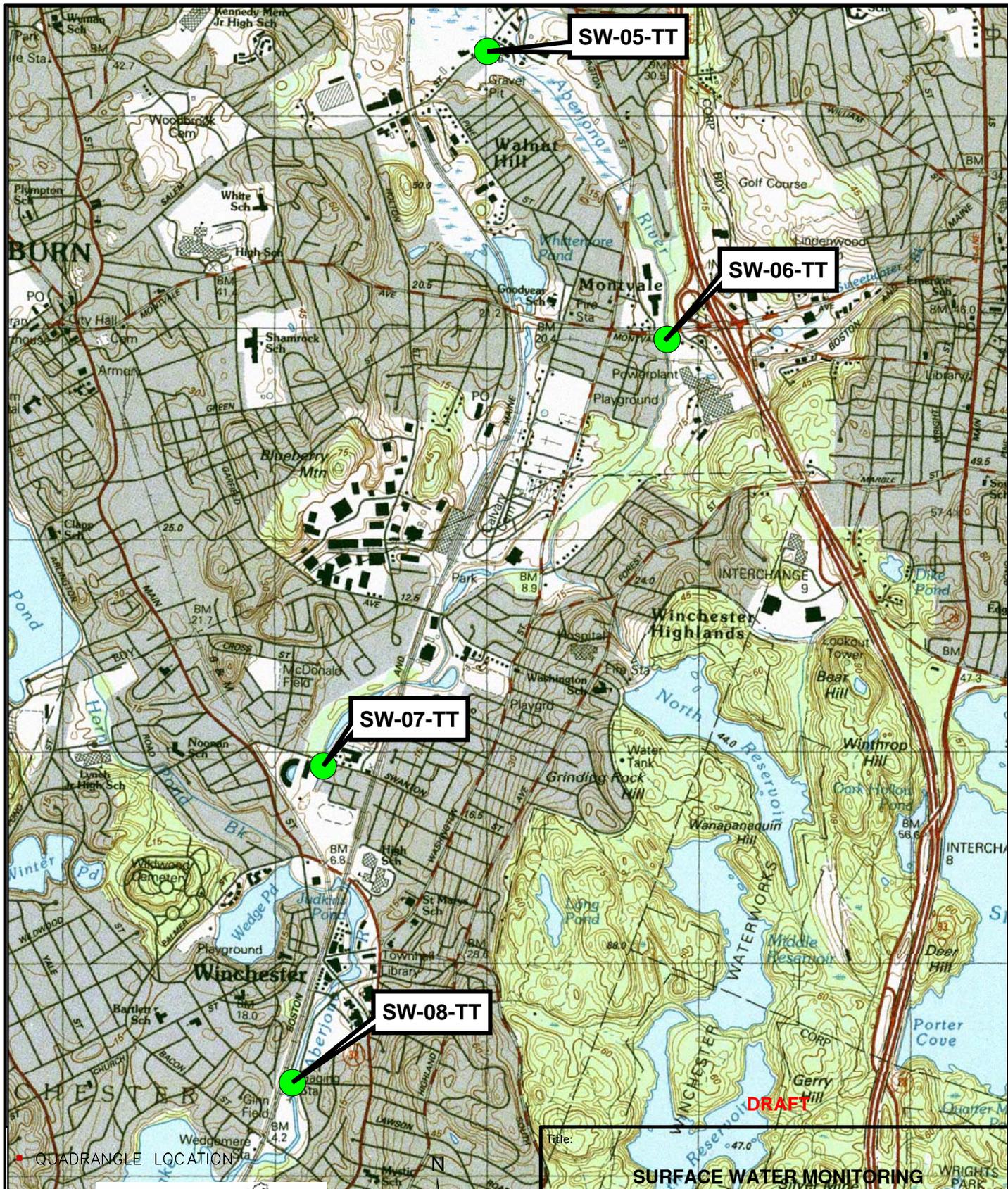
LEGEND

SW-01-TT ■ APPROXIMATE LOCATION AND DESIGNATION OF SURFACE WATER MONITORING STATION

DRAFT

<p>Title:</p> <h2 style="margin: 0;">SURFACE WATER MONITORING STATIONS NORTH OF ROUTE 128</h2>			
<p>Prepared for:</p> <p style="text-align: center;">INDUSTRI-PLEX OU 2 SETTLING DEFENDANTS</p>			
<p>ROUX ROUX ASSOCIATES INC. <i>Environmental consulting & Management</i></p>	<p>Compiled by: LM Prepared by: CRS Project Mgr.: LM File No.: IPS0114202</p>	<p>Date: 7/10/09 Scale: AS SHOWN Office: MA Project No.: 119407M07</p>	<p>FIGURE</p> <h1 style="margin: 0;">1</h1>

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QUADRANGLE LOCATION

MA

SOURCE:
USGS, 1987.
Reading (Massachusetts) Quadrangle
1:25,000—scale Topographic Map

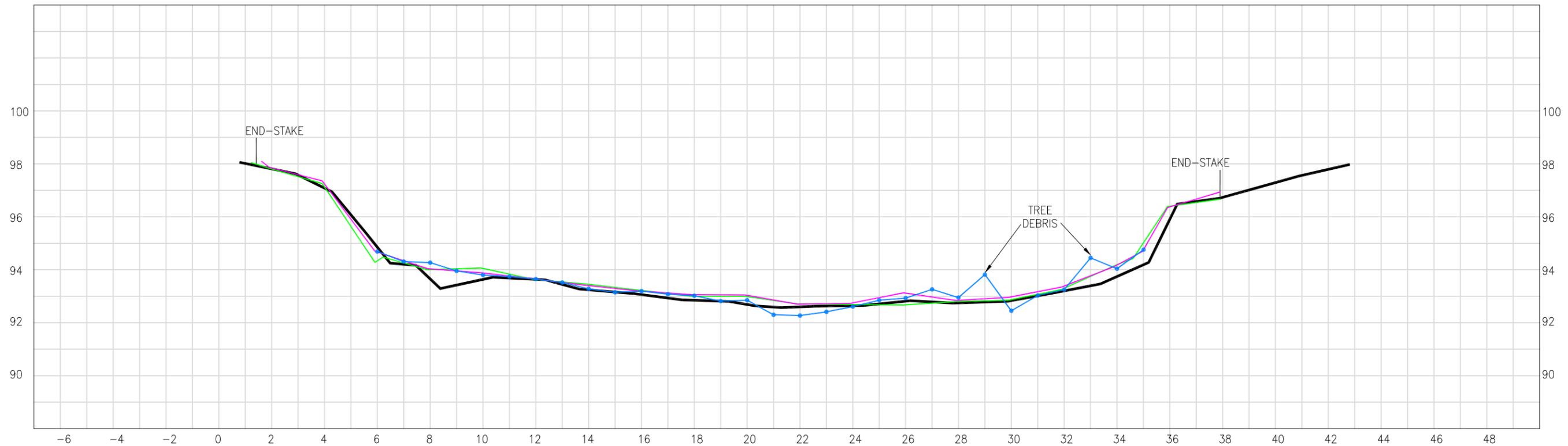
0 1,000 2,000
Feet

Title:
SURFACE WATER MONITORING STATIONS SOUTH OF ROUTE 128

Prepared For:
INDUSTRI-PLEX OU 2 SETTLING DEFENDANTS

 ROUX ROUX ASSOCIATES, INC. <i>Environmental Consulting & Management</i>	Compiled By: LM	Date: 7/10/09	FIGURE 2
	Prepared By: CRS	Scale: AS SHOWN	
	Project Mgr.: LM	Office: MA	
	File No.: IPS0114201	Project: 119401M	

N:\PROJECTS\I-PLEX\119401M07\154\IPS0115402.dwg



DRAFT

- Notes:
1. Profile is drawn looking upstream.
 2. Elevations are referenced to an arbitrary benchmark (=100 ft) at the southeast corner of concrete pad.

- BASELINE (MARCH 2009) CROSS-SECTION
- 06-25-09 POST-STORM CROSS-SECTION
- 07-27-09 POST-STORM CROSS-SECTION
- 11-18-09 POST-STORM CROSS-SECTION

Title: **POST-STORM STREAM CROSS-SECTIONS
STATION SW-06-TT
(MONTVALE AVENUE)**

Prepared For: **INDUSTRI-PLEX OU2 SETTLING DEFENDANTS**

 ROUX ASSOCIATES, INC. <i>Environmental Consulting & Management</i>	Compiled by: LM	Date: 12/14/09	FIGURE 3
	Prepared by: CRS	Scale: AS SHOWN	
	Project Mgr: LM	Office: MA	
	File No: IPS0115402	Project: 119401M07	

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APPENDIX A

Storm Hydrographs including Narrative

November 14-15, 2009

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Storm Narrative

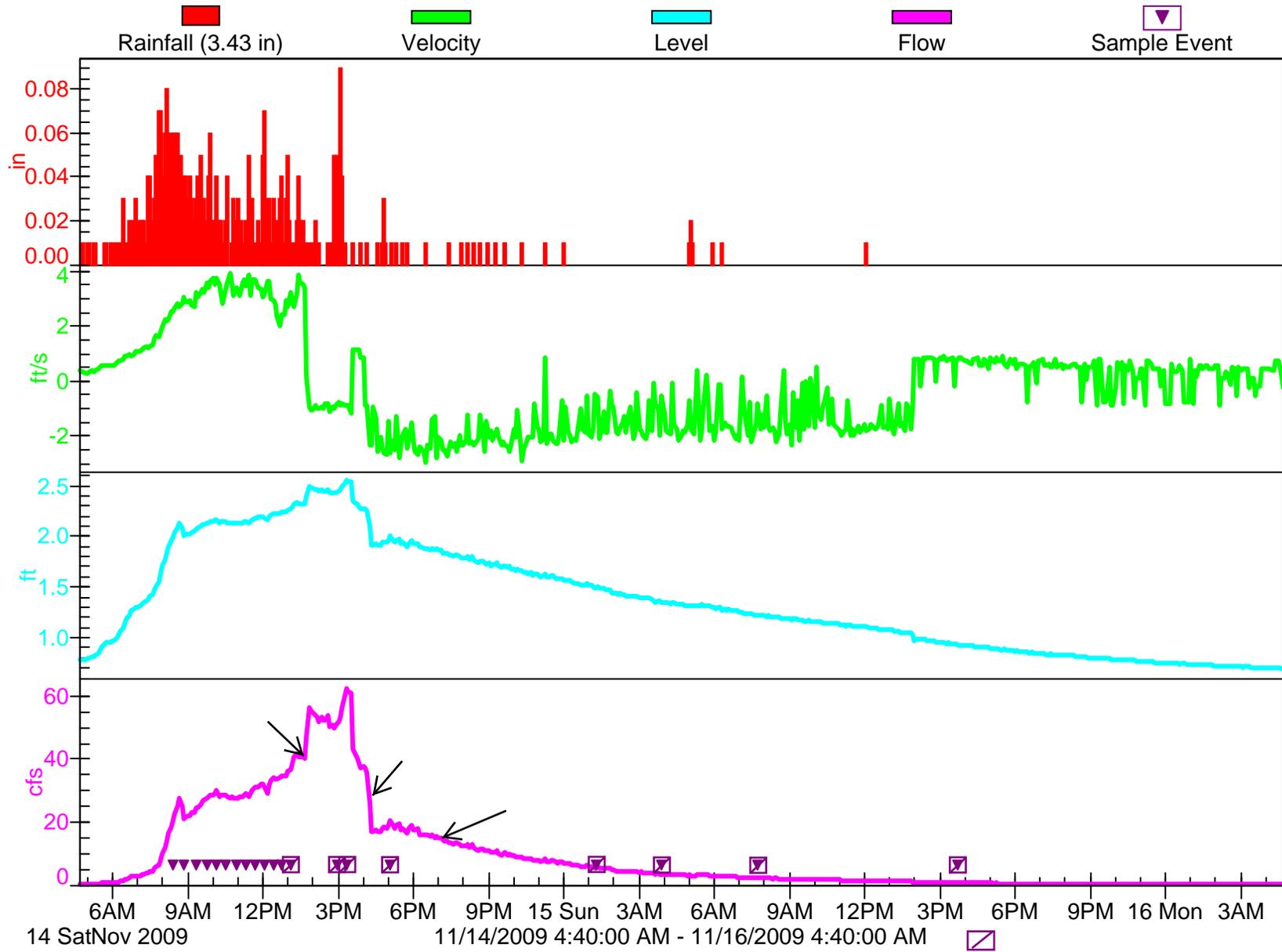
November 14-15, 2009

Samplers activated after initial rain due to changed forecast.

- **SW-01-TT:**
 - The initial aliquot was not collected due to a manufacturer program error associated with delayed activation of samplers
 - Aliquots 13 through 30 were not collected due to a clogged stream intake from debris
 - A/V sensor became dislodged at approximately 1:40 pm on 11/14; therefore, subsequent velocity and stage (and hence flow) data do not represent actual conditions
- **SW-2-IP:**
 - The initial aliquot was not collected due to a manufacturer program error associated with delayed activation of samplers
 - Aliquots were not collected between approximately 10:18 am and 11:19 am; 1:48 pm and 3:34 pm; and 8:34 pm and 9:00 pm on 11/14 due to rosette change out activities
- **SW-3-IP:**
 - The initial aliquot was not collected due to a manufacturer program error associated with delayed activation of samplers
 - Pond backup began at approximately 9:20 am on 11/14
- **SW-02-TT:**
 - Aliquots were not collected between approximately 8:02 pm and 9:36 pm on 11/14 due to rosette change out activities
 - No velocity data was reported during the storm event due to equipment malfunction
- **SW-03-TT:**
 - A 0.5-ft difference was observed between staff gauge and Isco A/V sensor at the time of benzene sampling (12:33 pm on 11/14)
- **SW-04-TT:**
 - The initial aliquot was not collected due to a manufacturer program error associated with delayed activation of samplers
 - A 0.5-ft difference was observed between staff gauge and Isco A/V sensor at the time of benzene sampling (12:24 pm on 11/14)
 - A 1-ft difference was observed between staff gauge and Isco A/V sensor during rosette change out activities (10:10 pm on 11/14)
- **SW-05-TT:**
 - Aliquots were not collected between approximately 6:33 pm and 7:10 pm on 11/14 and 6:26 am and 10:26 am on 11/15 due to rosette change out activities
 - A 0.5-ft difference was observed between staff gauge and Isco A/V sensor at the time of benzene sampling (1:38 pm on 11/14)
- **SW-06-TT:**
 - Initial 18 aliquots shown on the hydrograph were not successfully collected due to disconnected tubing; composite includes only the subsequent 50 aliquots
 - Precipitation low due to interference from building and/or trees (chronic problem)
- **SW-07-TT:**
 - Two aliquots collected after 75% of the falling limb was reached (not shown on hydrograph) but were inadvertently included in composite
 - A 0.5-ft difference was observed between staff gauge and Isco A/V sensor at the time of benzene sampling (2:19 pm on 11/14)
- **SW-08-TT:**
 - A/V sensor became dislodged at approximately 10:00 am on 11/14; therefore, subsequent velocity and stage (and hence flow) data do not represent actual conditions
 - Aliquots were not collected between approximately 5:39 pm and 7:11 pm on 11/14; 1:46 am and 10:26 am; and 5:59 pm and 7:41 pm on 11/15 due to rosette change out activities
 - The last rosette of samples was not included in composite due to the uncertainty regarding accuracy of flow data

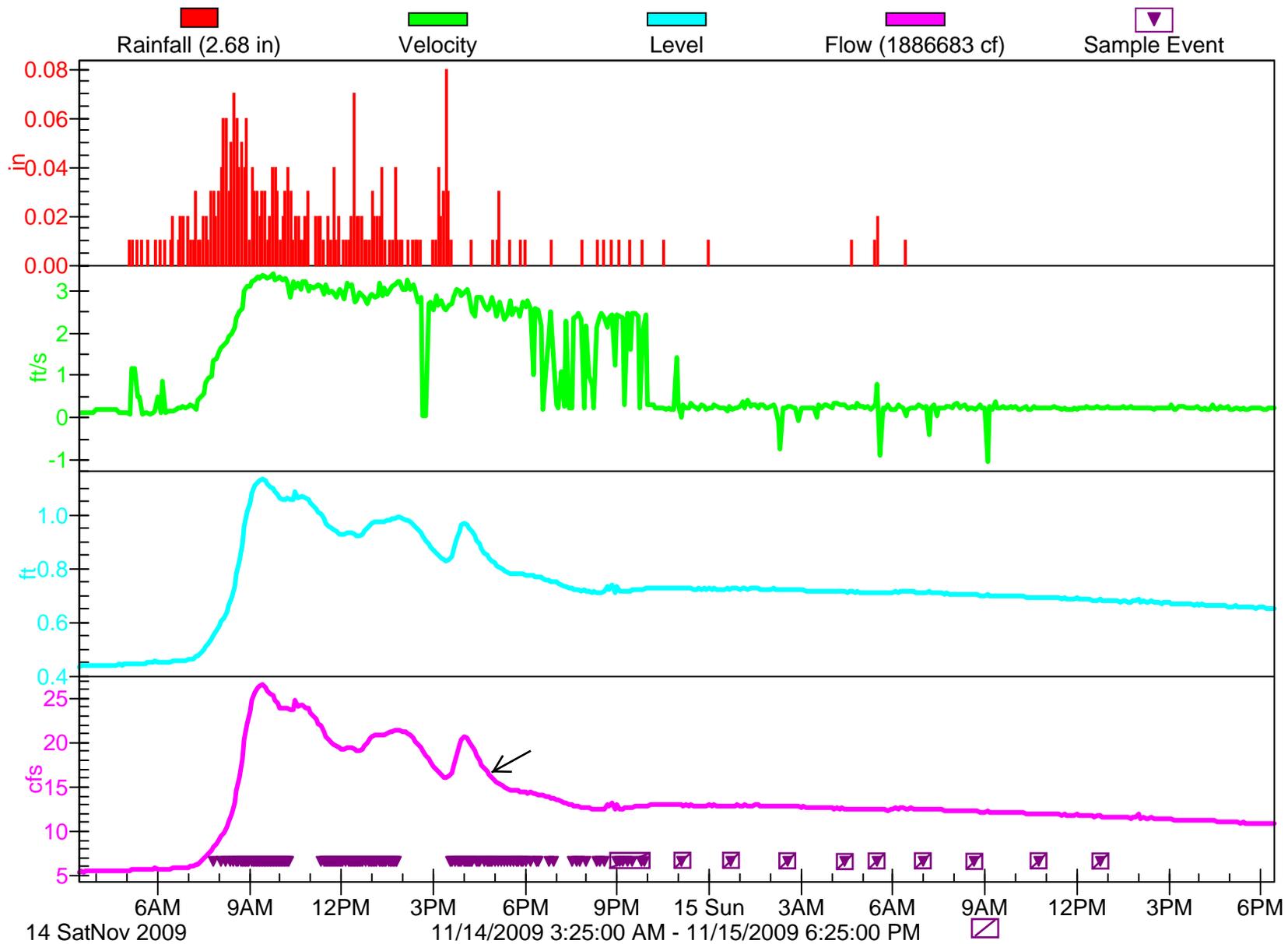
SW-01-TT

Flowlink 5



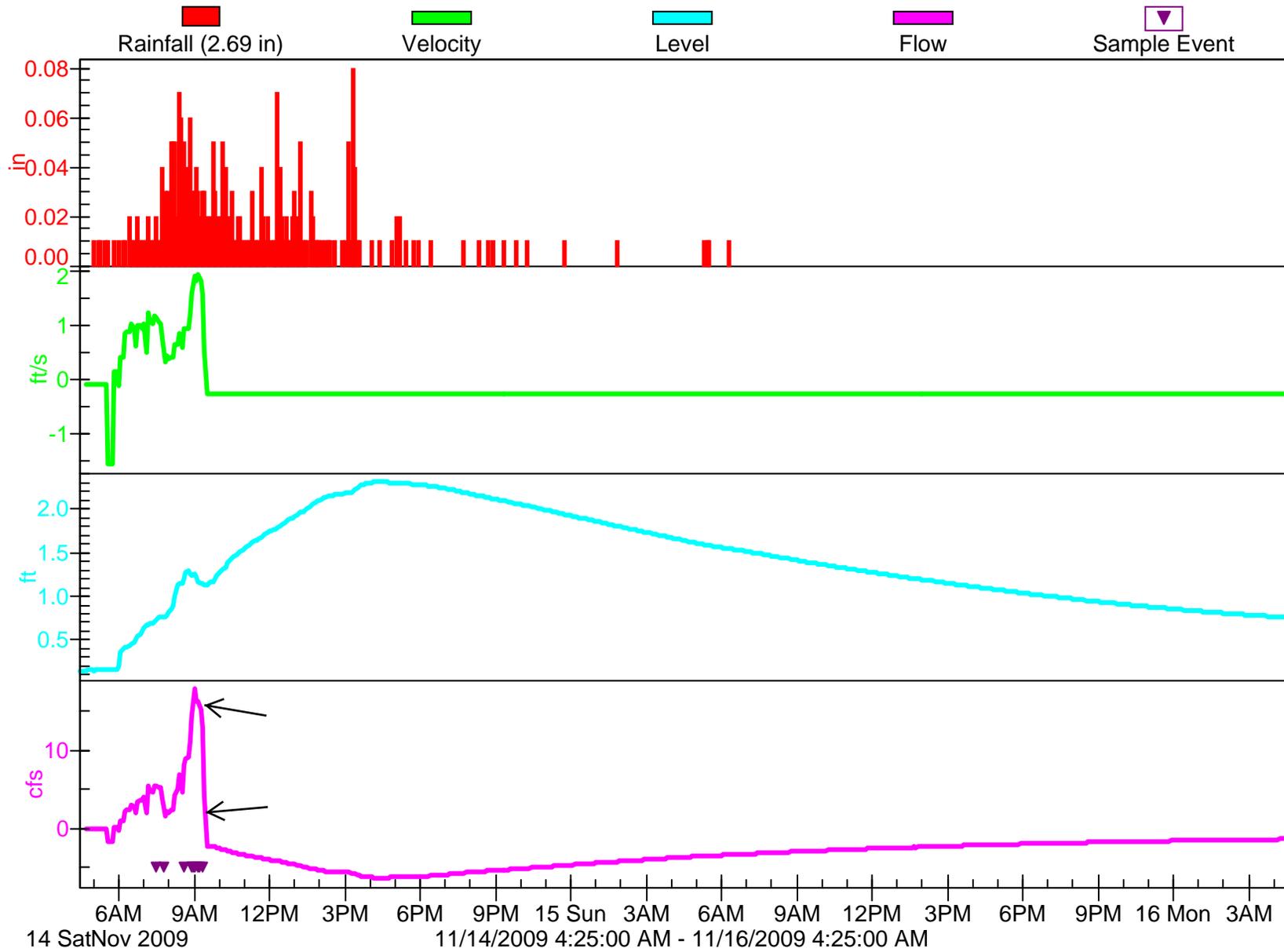
SW-2-IP

Flowlink 5



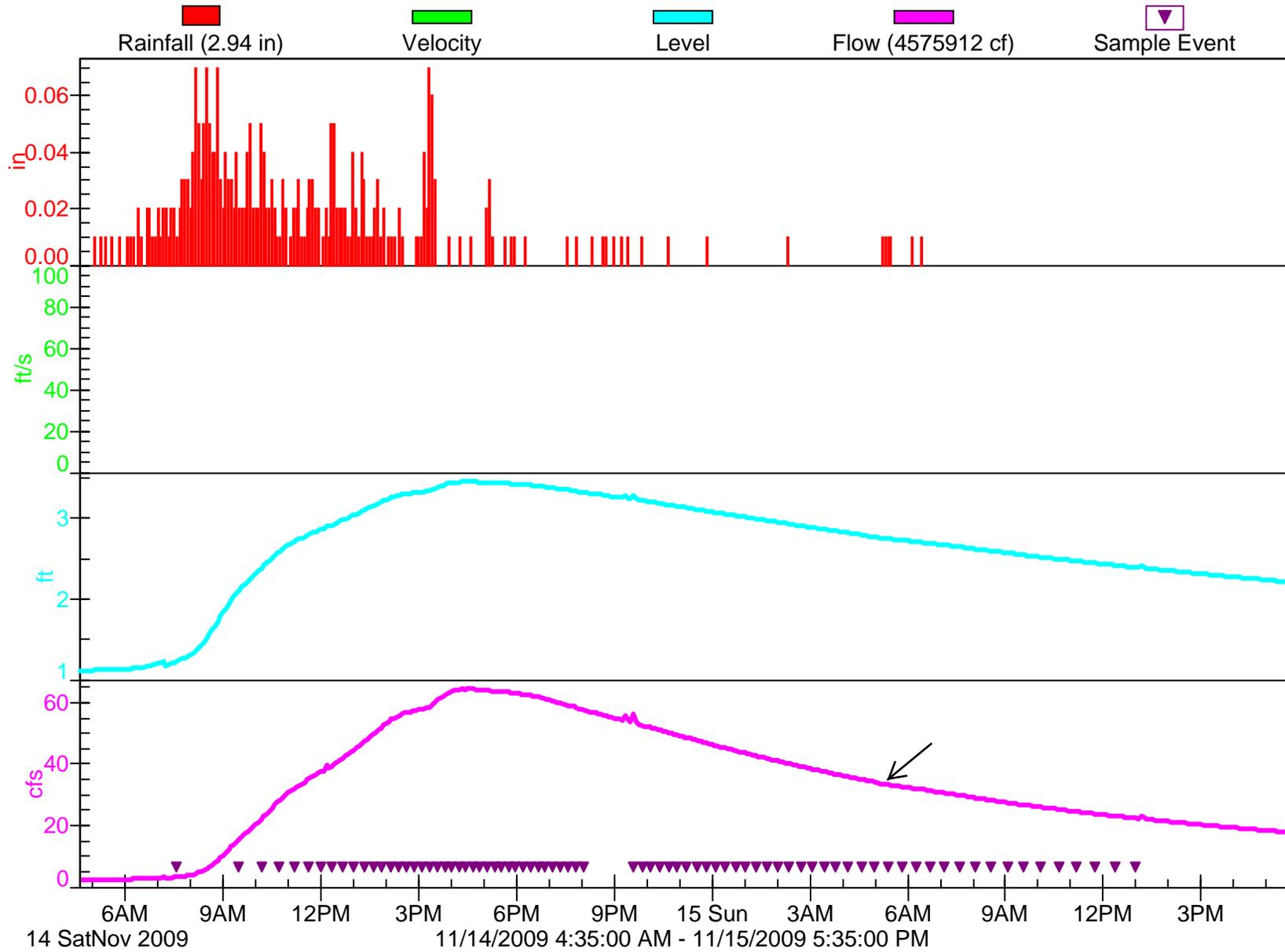
SW-3-IP

Flowlink 5



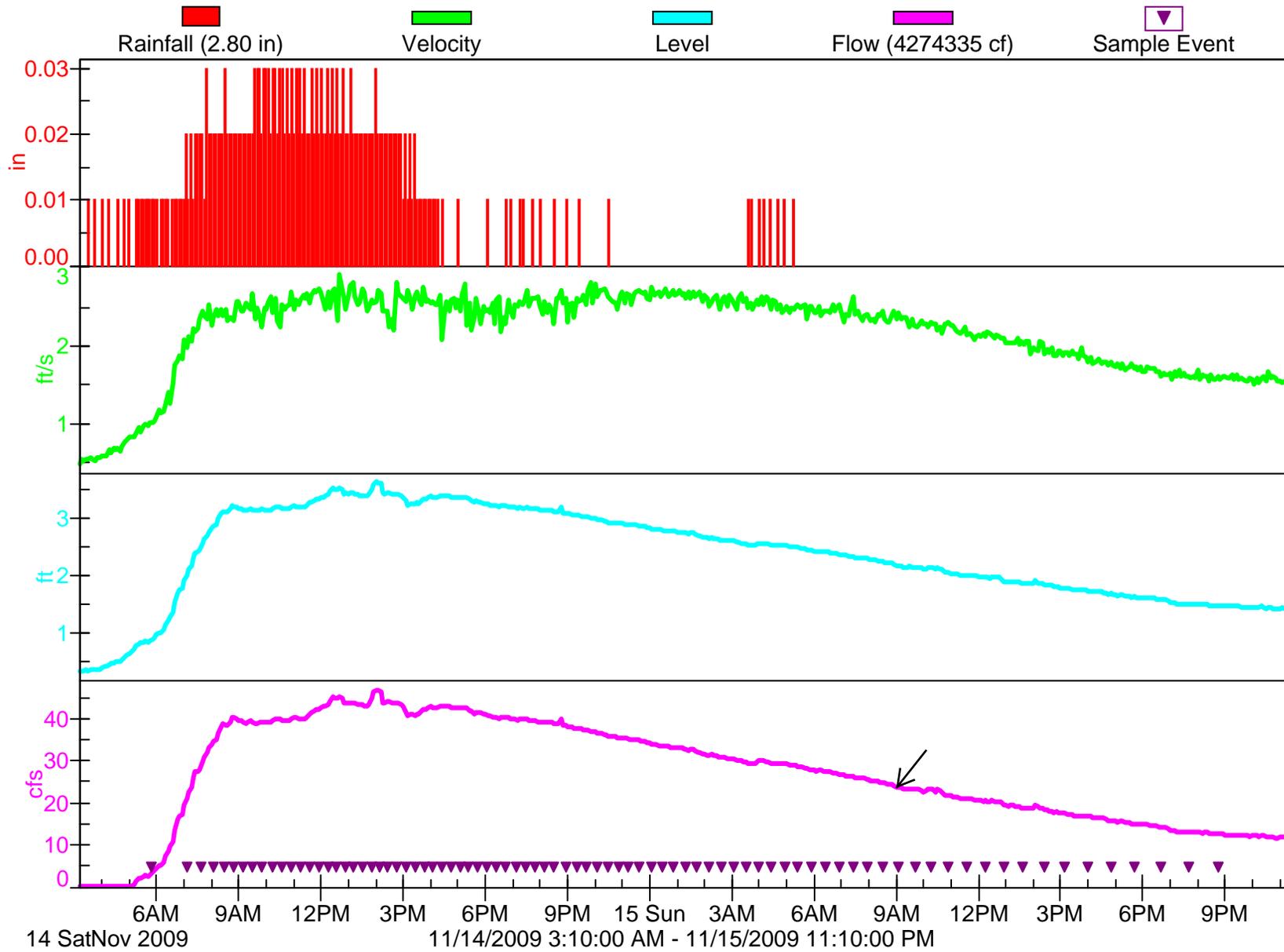
SW-02-TT

Flowlink 5



SW-03-TT

Flowlink 5

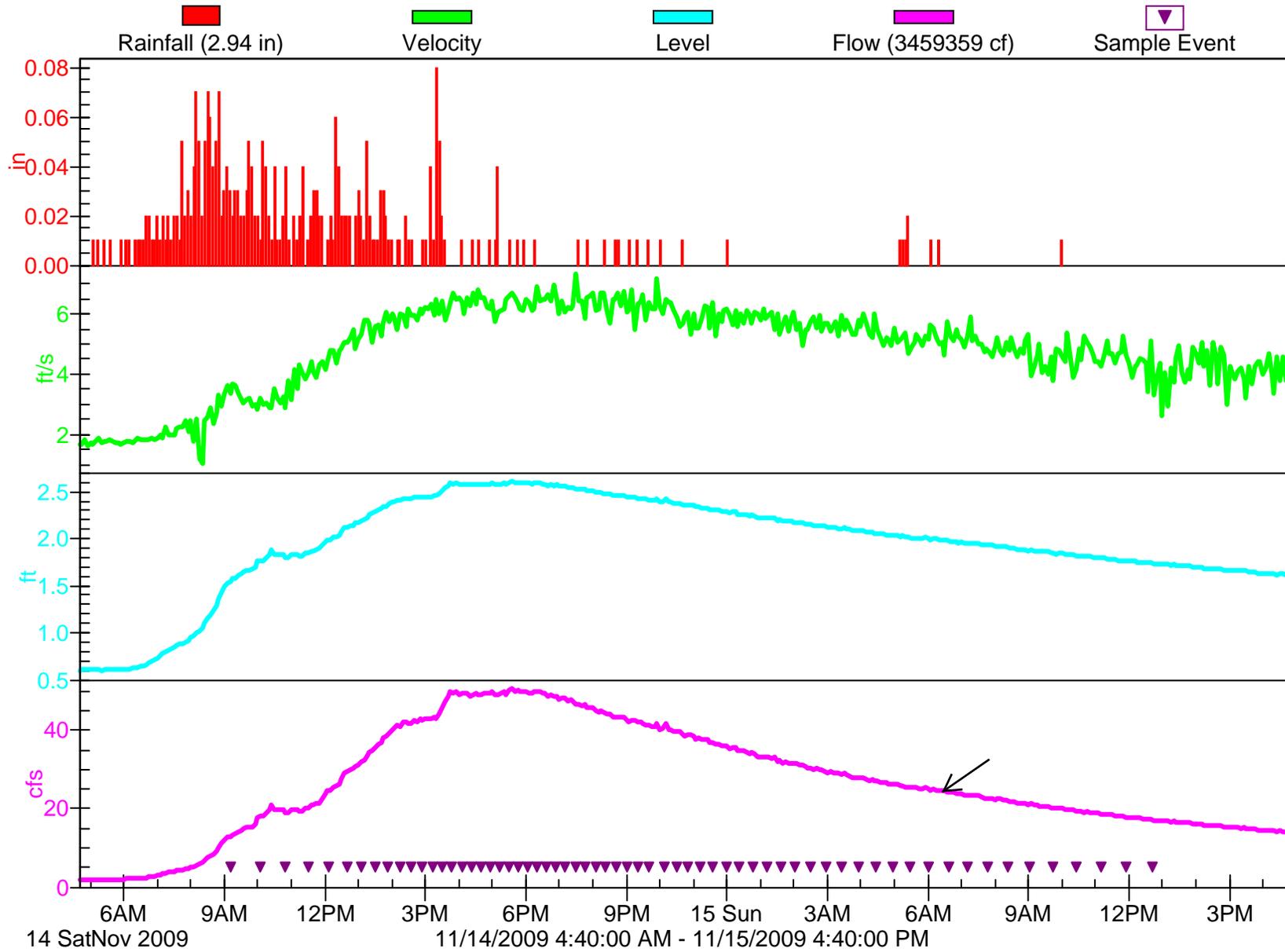


14 SatNov 2009

11/14/2009 3:10:00 AM - 11/15/2009 11:10:00 PM

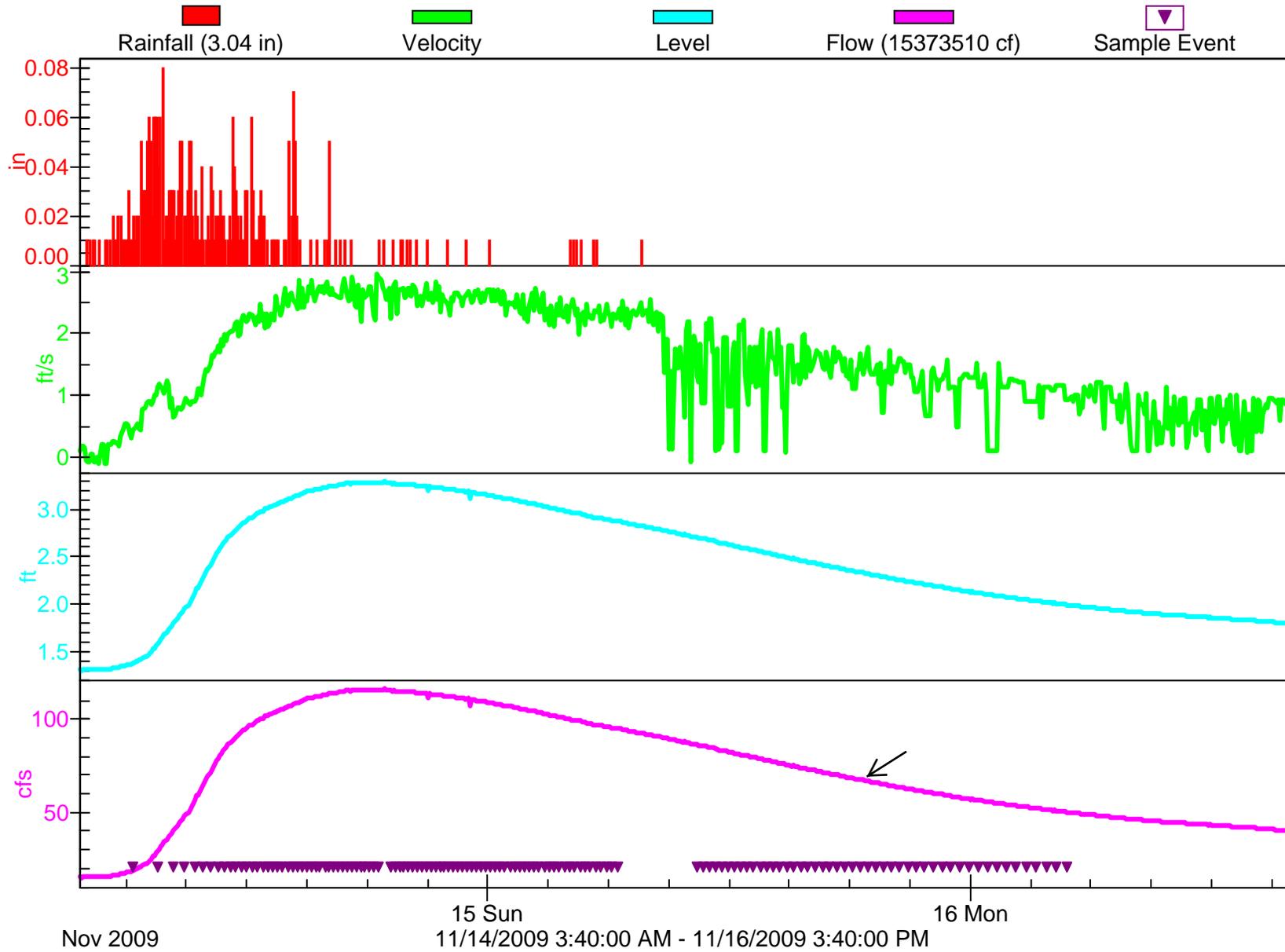
SW-04-TT

Flowlink 5



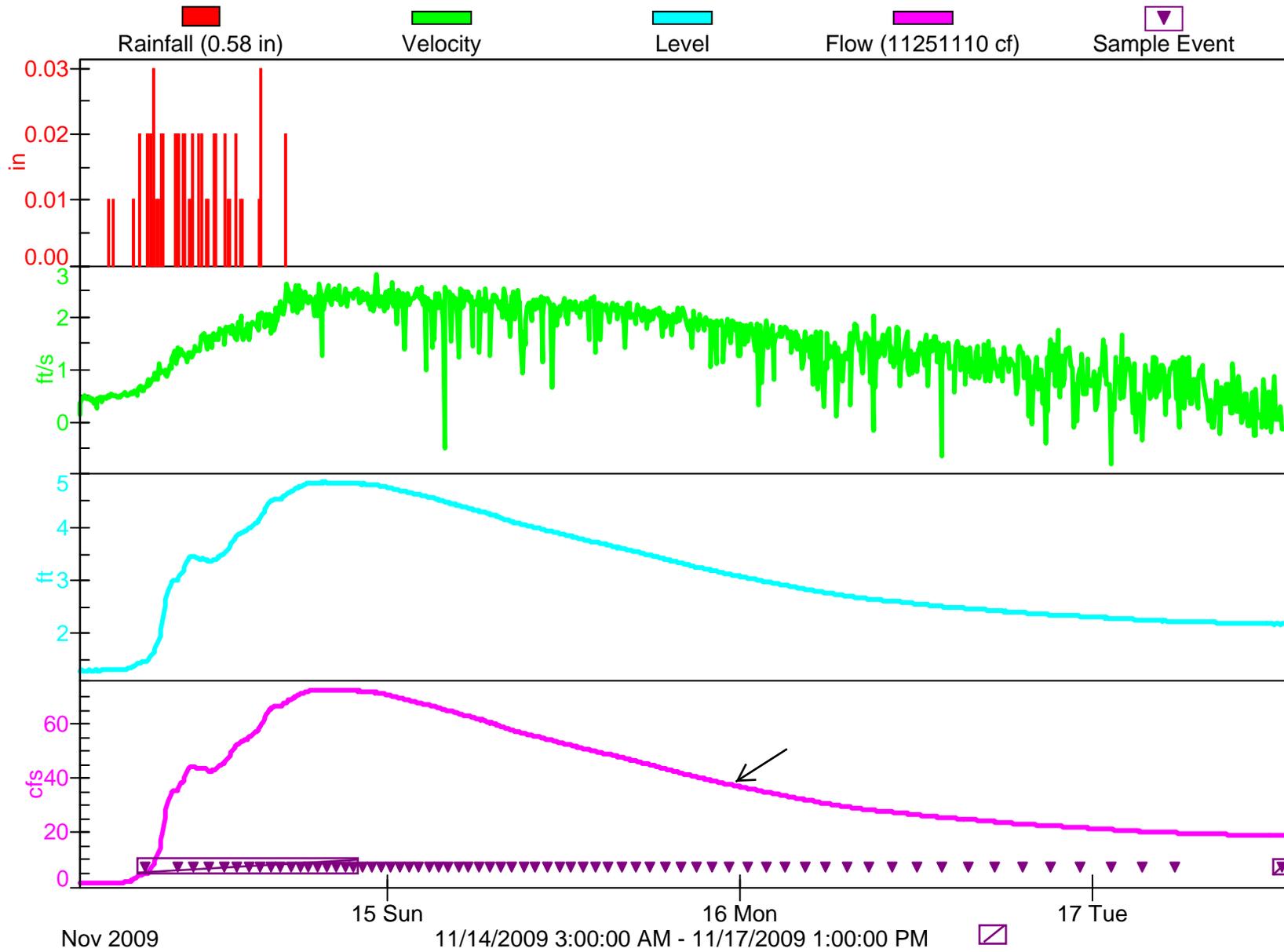
SW-05-TT

Flowlink 5



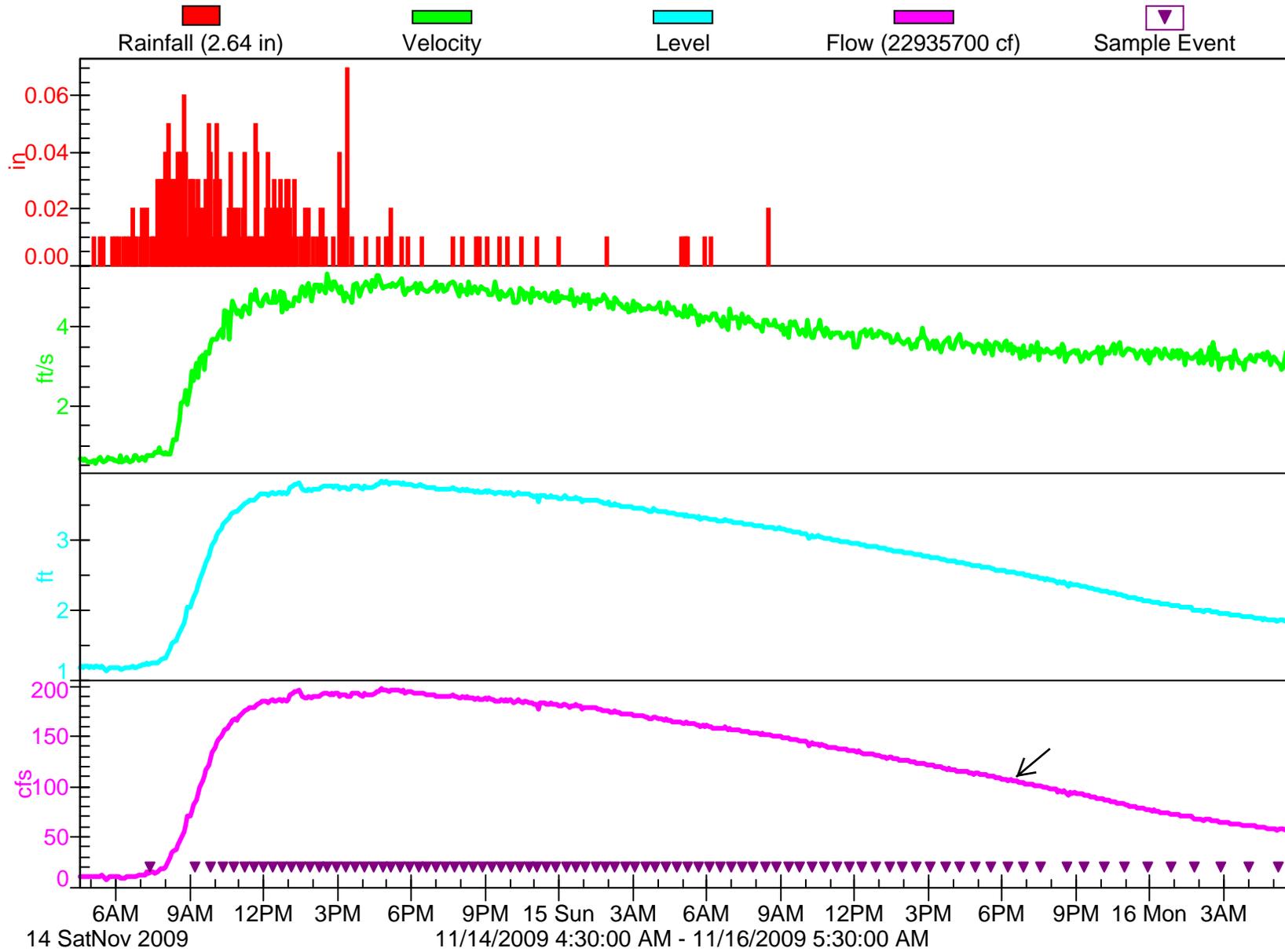
SW-06-TT

Flowlink 5



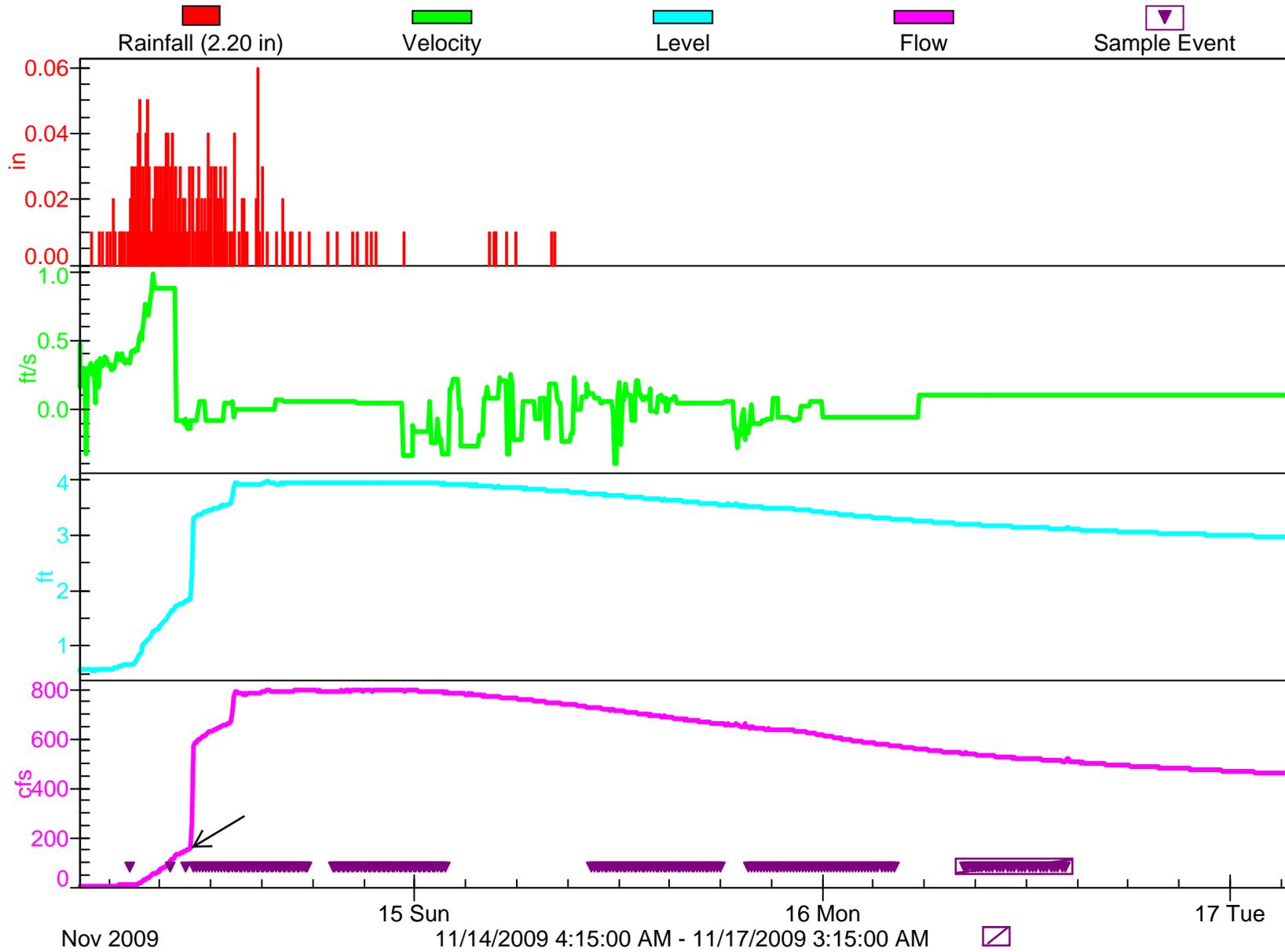
SW-07-TT

Flowlink 5



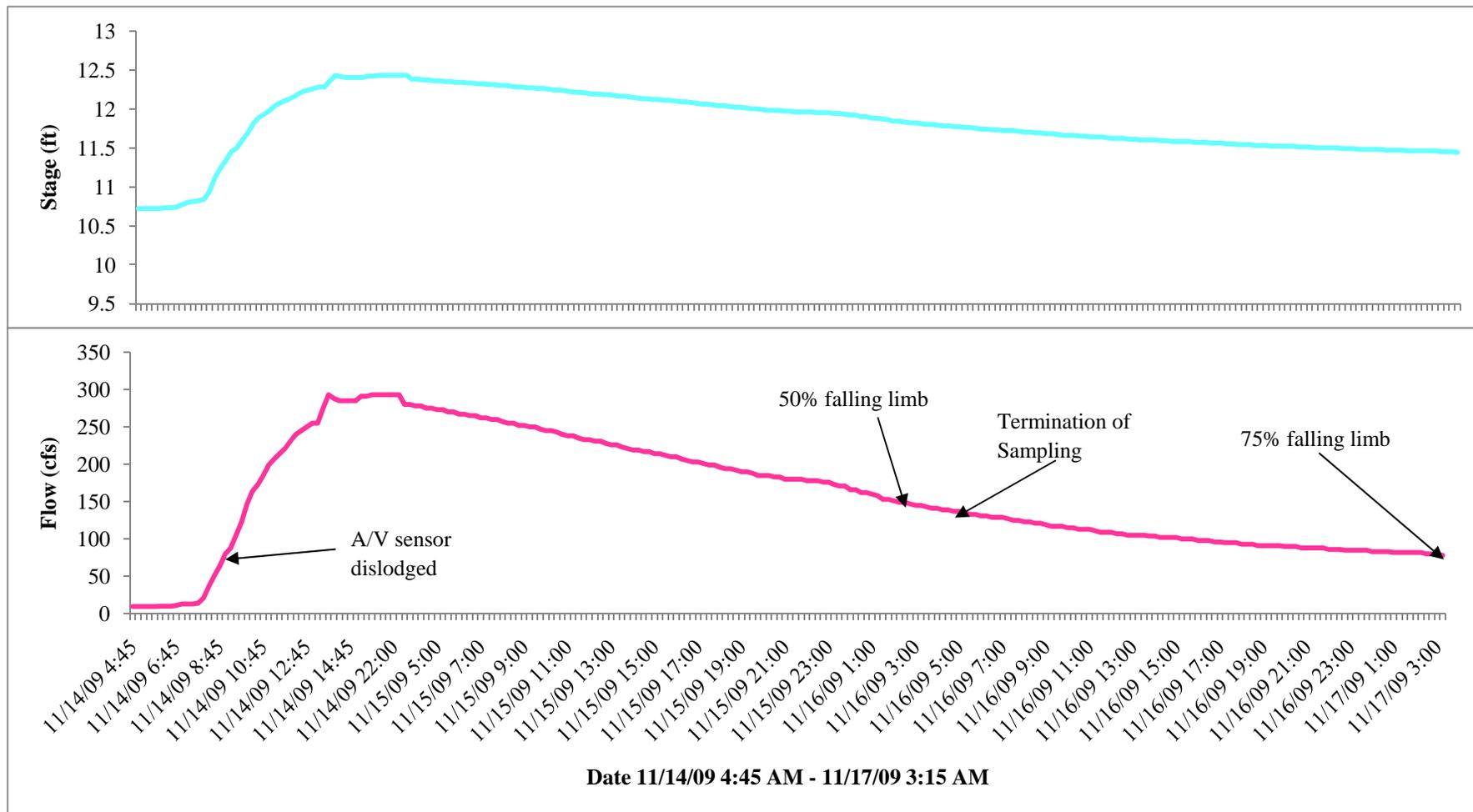
SW-08-TT

Flowlink 5



USGS 01102500 Aberjona River at Winchester, MA

(Monitoring Station SW-08-TT)

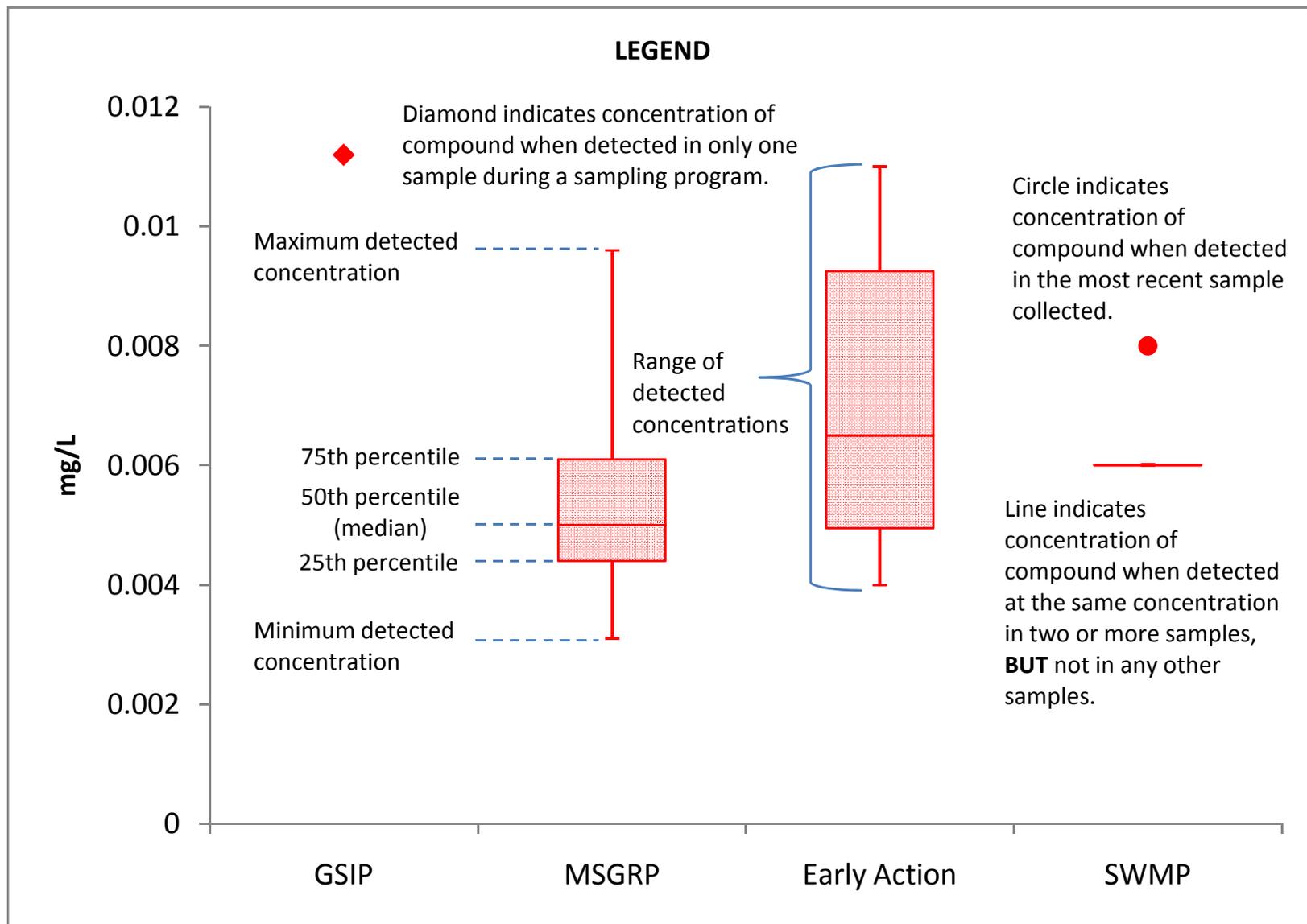


Data for stage and flow collected from the United States Geologic Survey (USGS) 01102500 Aberjona River at Winchester, MA monitoring station. <<http://waterdata.usgs.gov/nwis/uv?01102500>>

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APPENDIX B

Storm Sampling Box-Whisker Plots

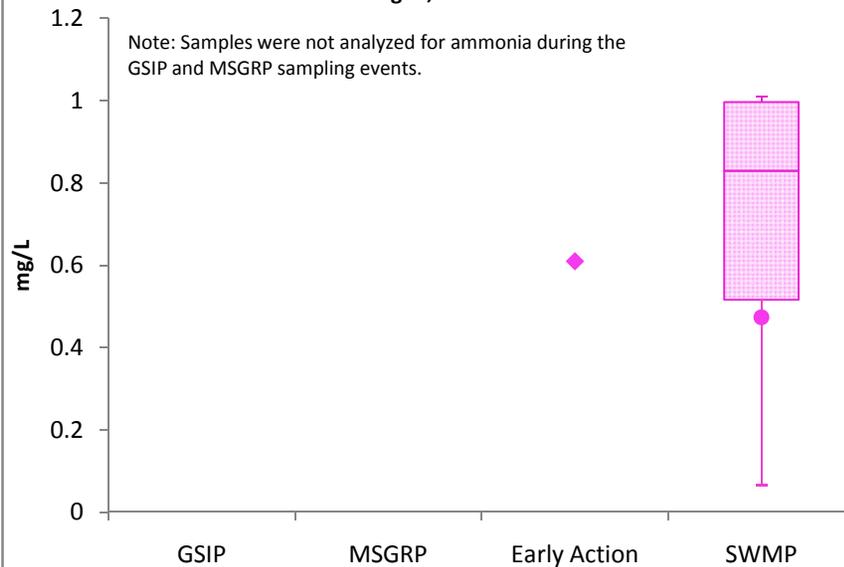


Dissolved Arsenic

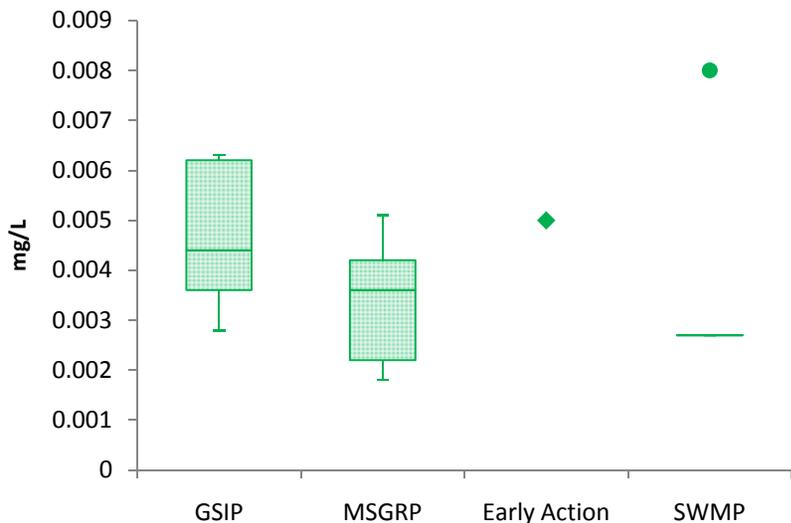
Note: Arsenic (dissolved) was not detected in any GSIP, MSGRP, Early Action or SWMP storm flow samples from this station.

Nitrogen, Ammonia

Note: Samples were not analyzed for ammonia during the GSIP and MSGRP sampling events.

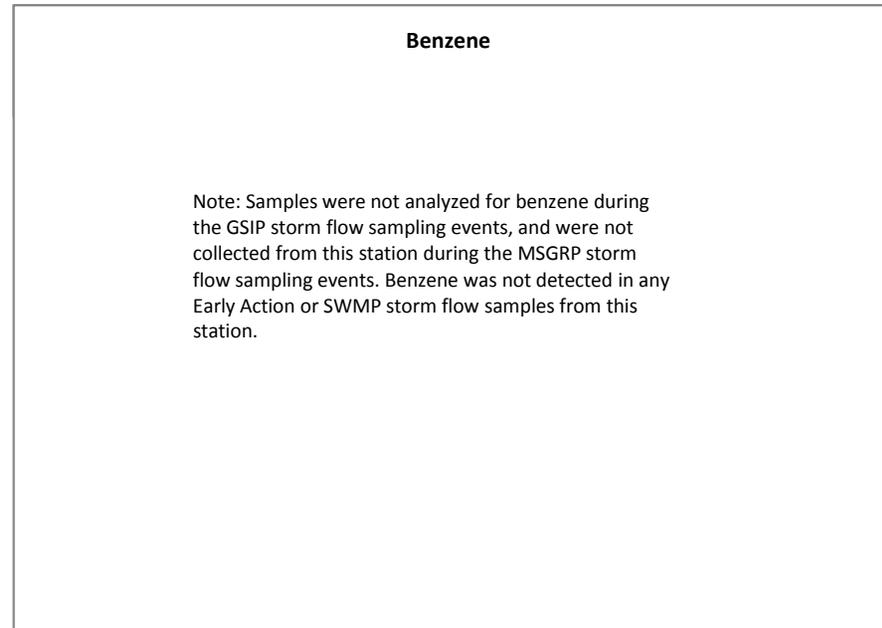
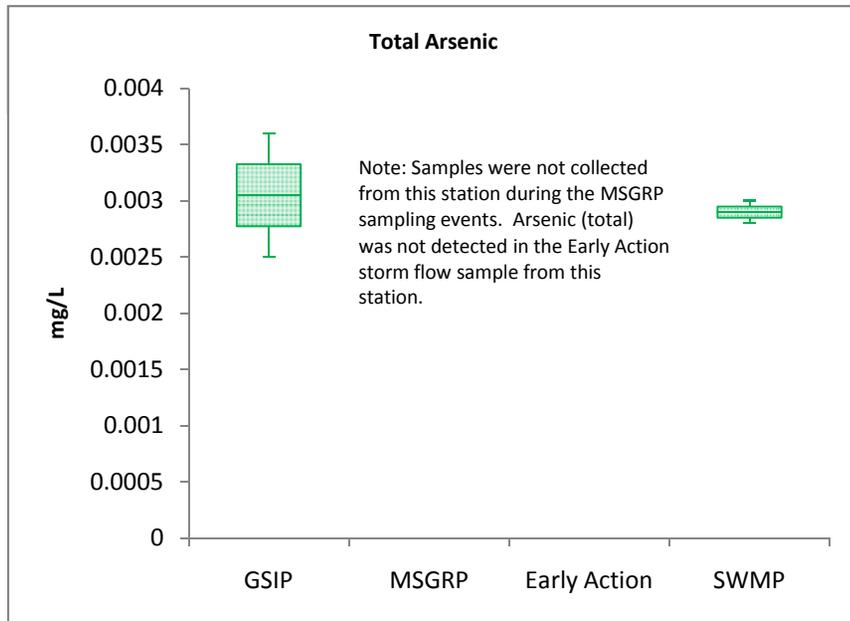
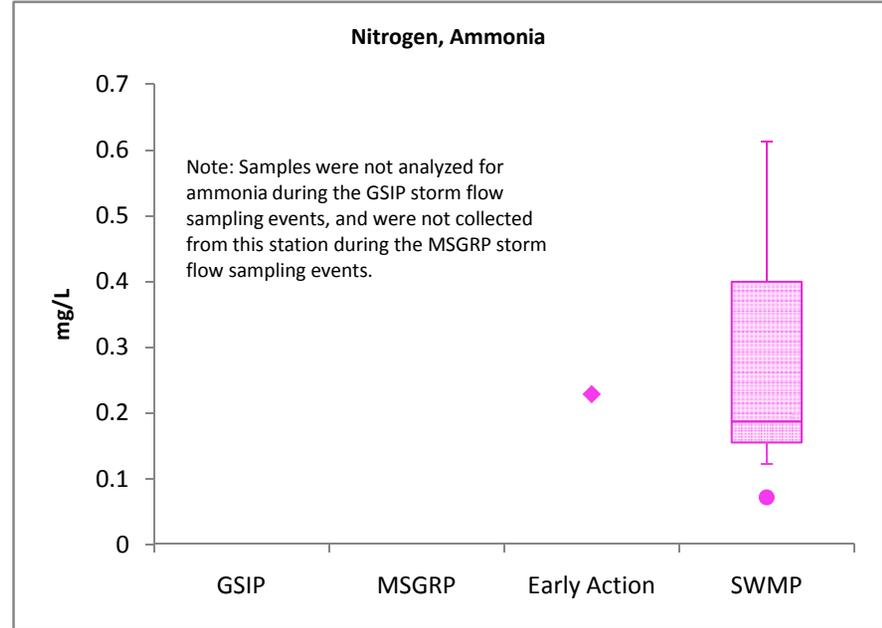
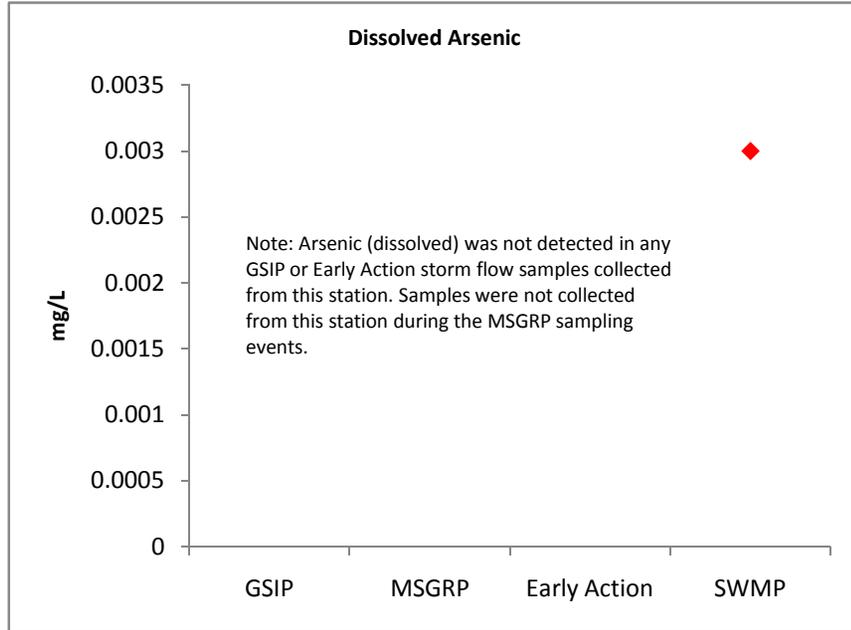


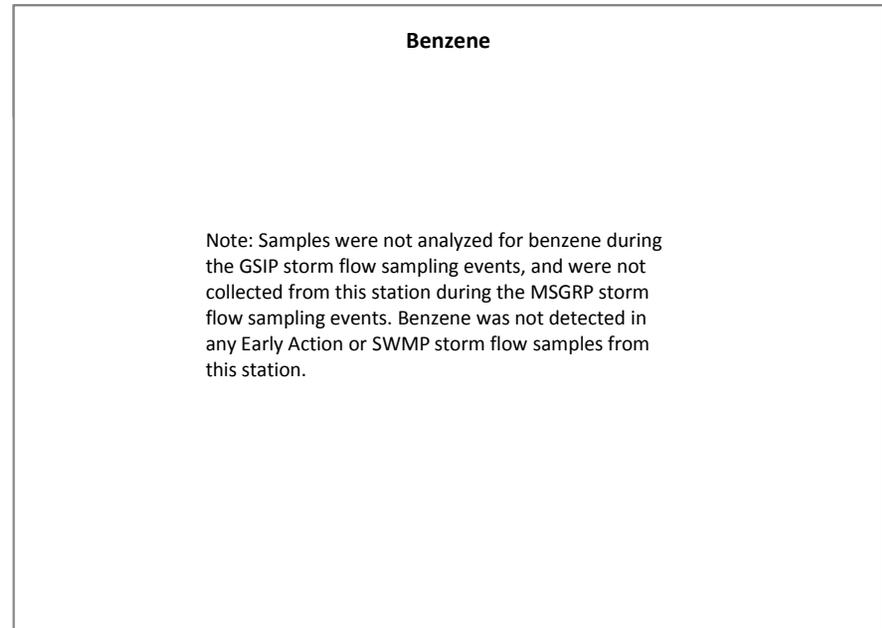
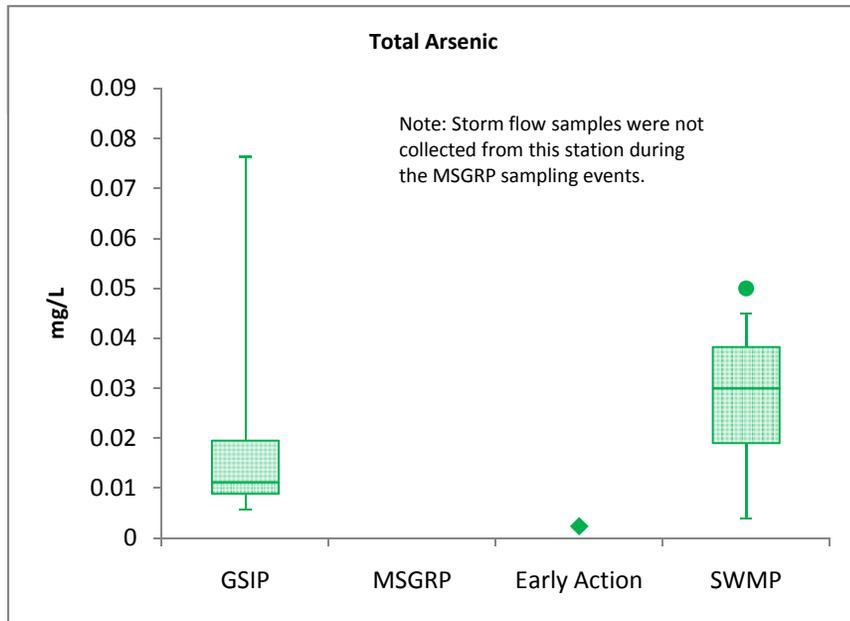
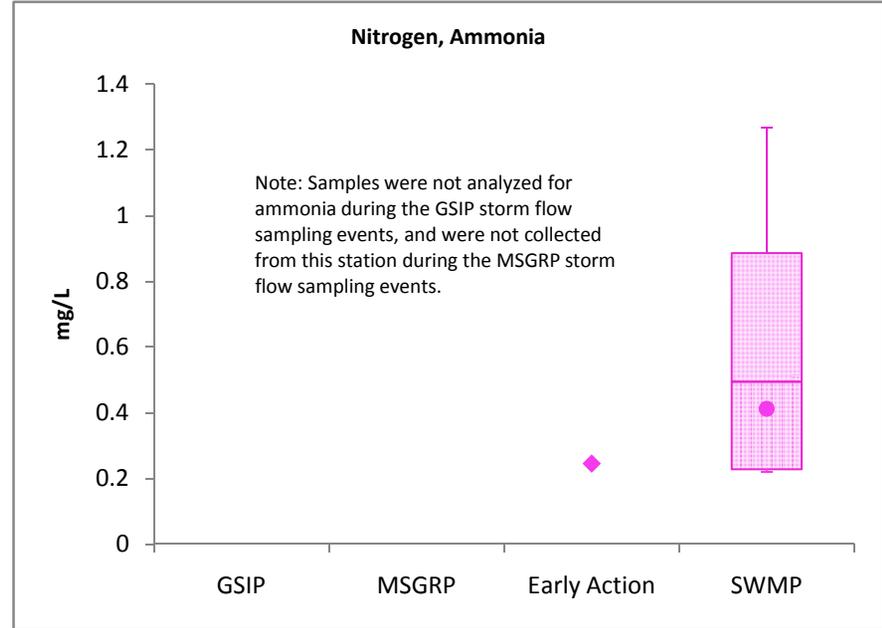
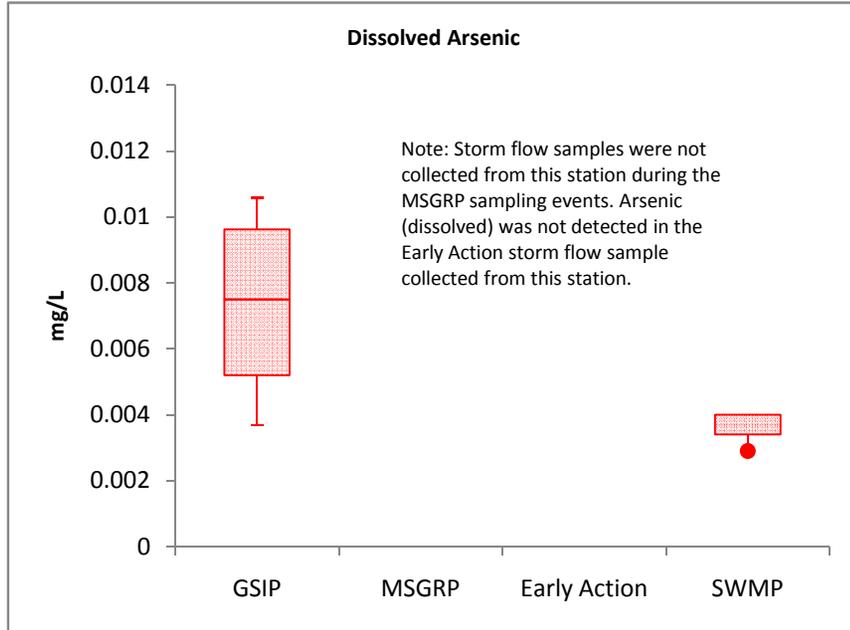
Total Arsenic

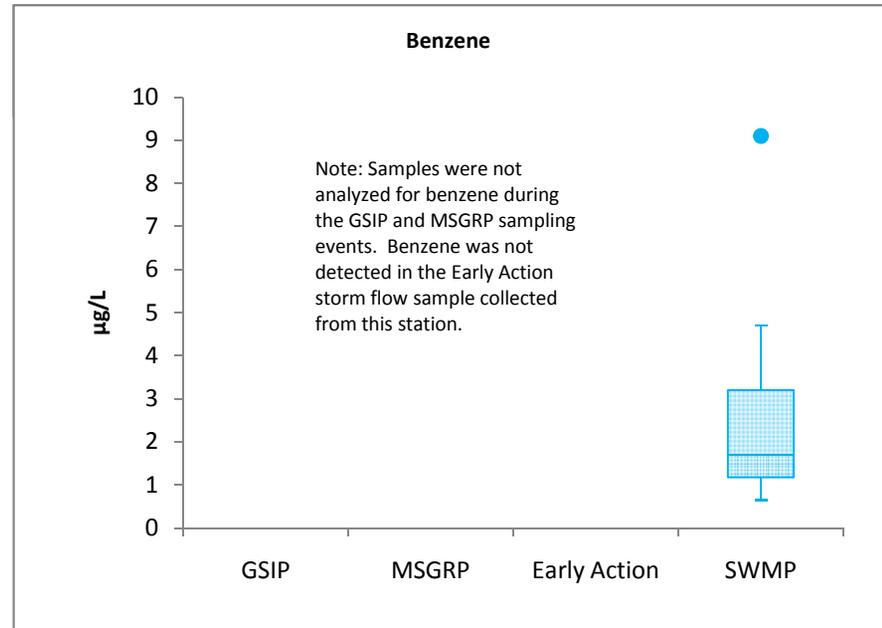
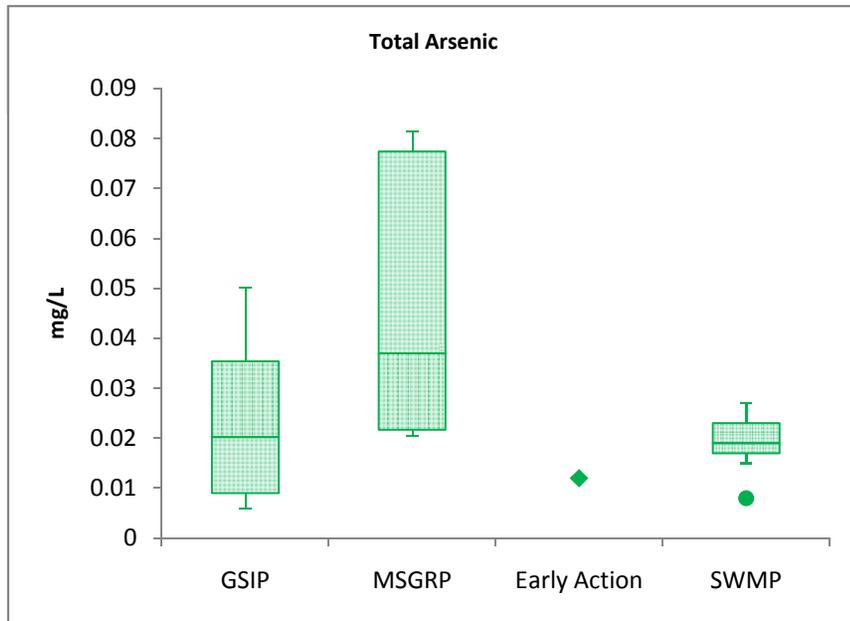
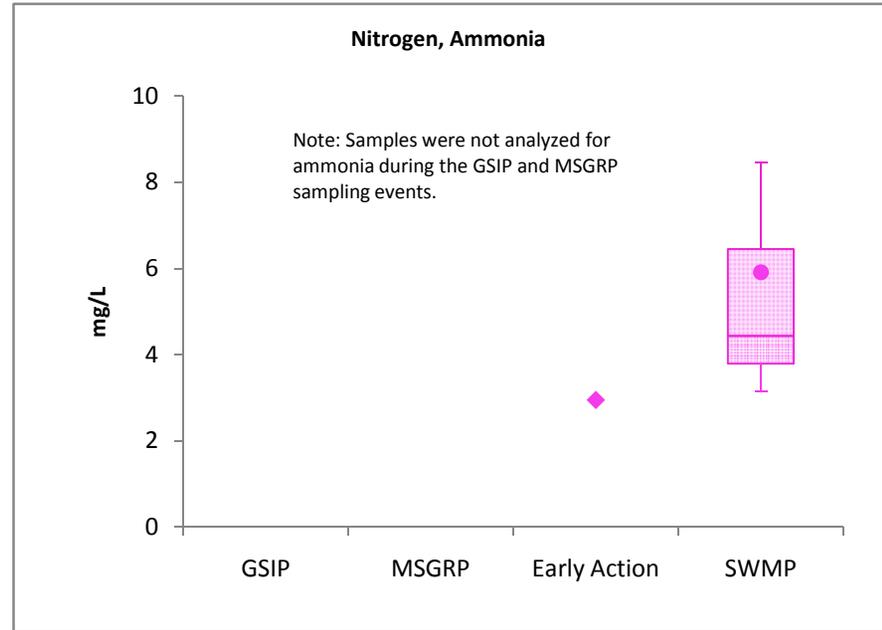
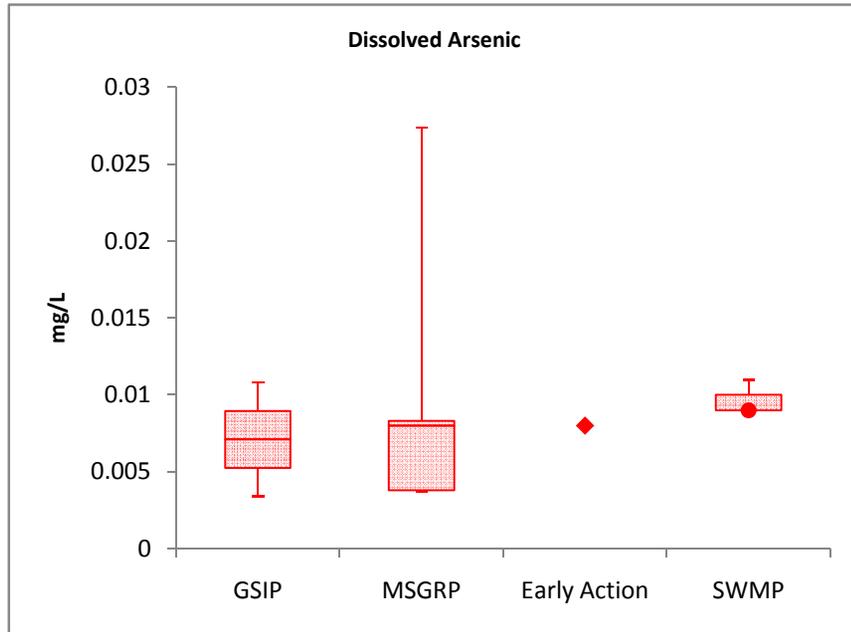


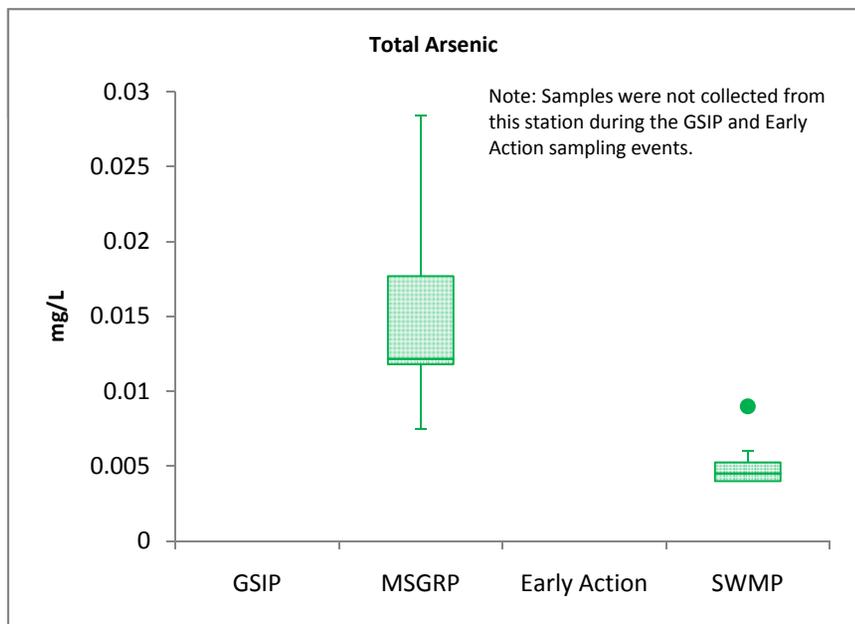
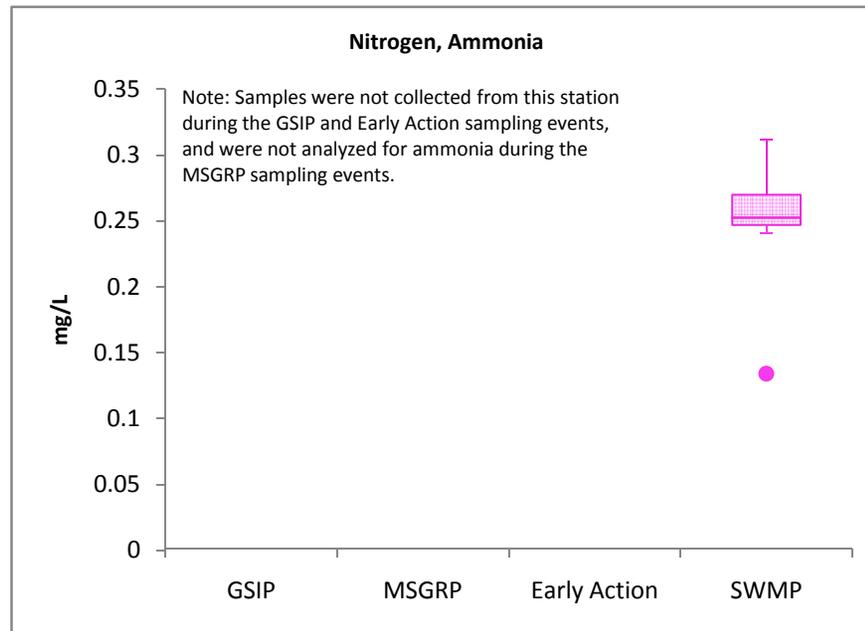
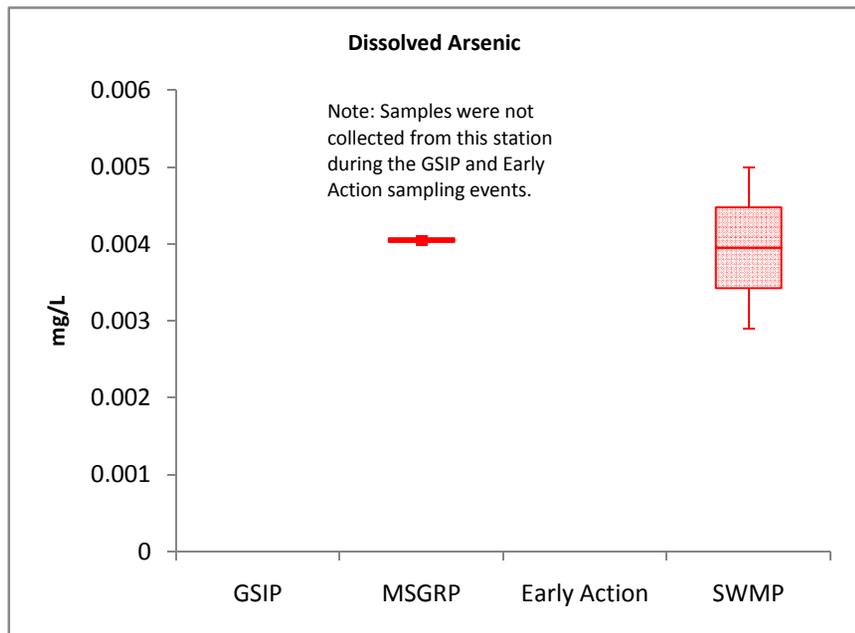
Benzene

Note: Samples were not analyzed for benzene during the GSIP and MSGRP sampling events, and benzene was not detected in any Early Action or SWMP storm flow samples from this station.

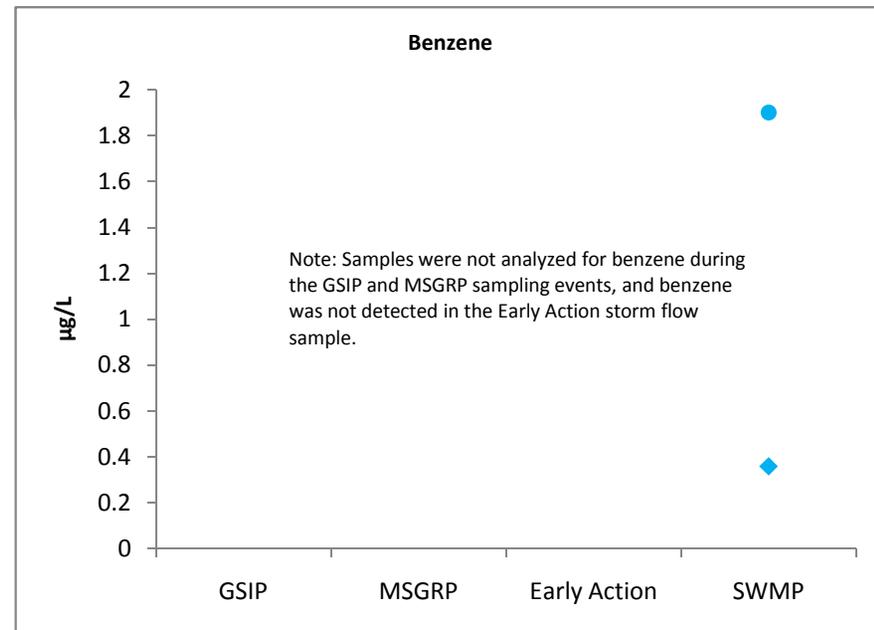
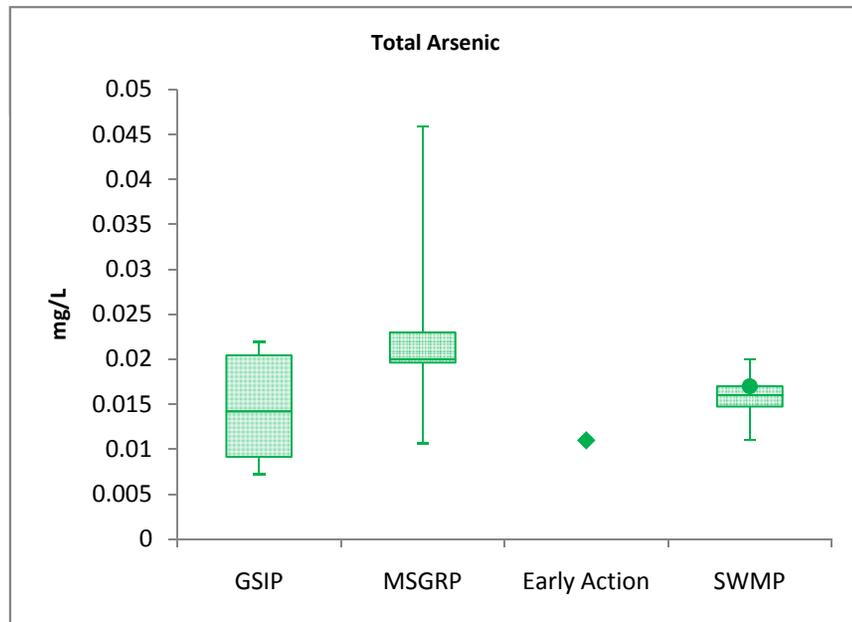
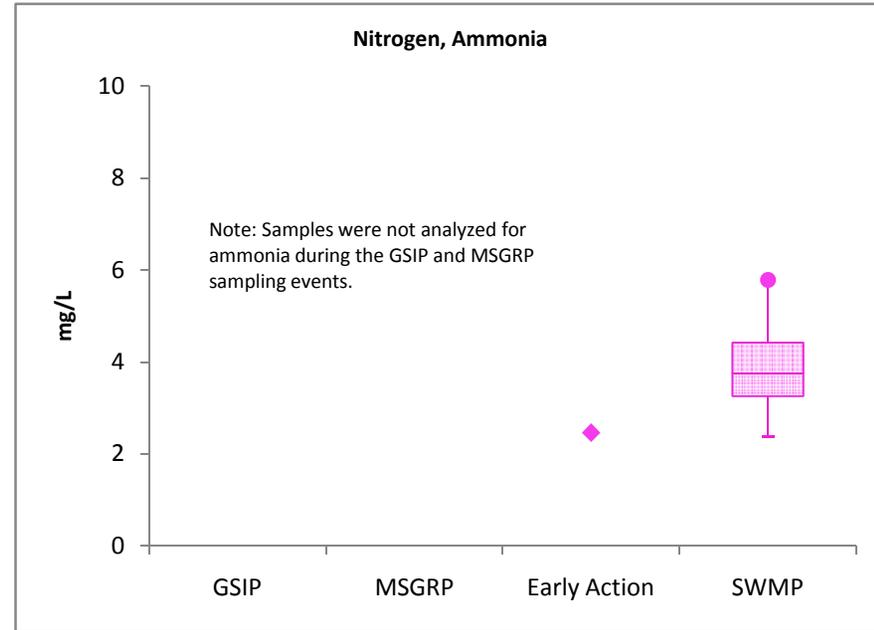
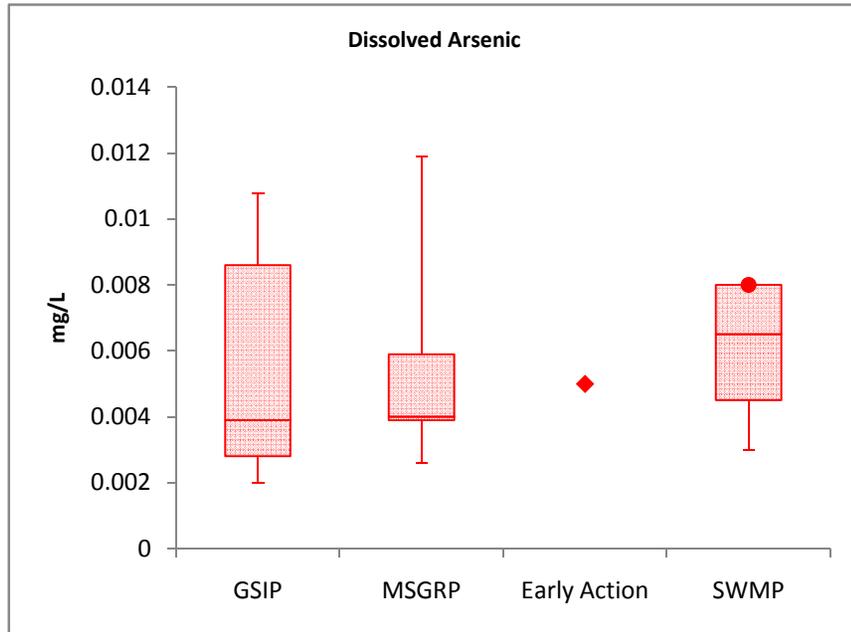


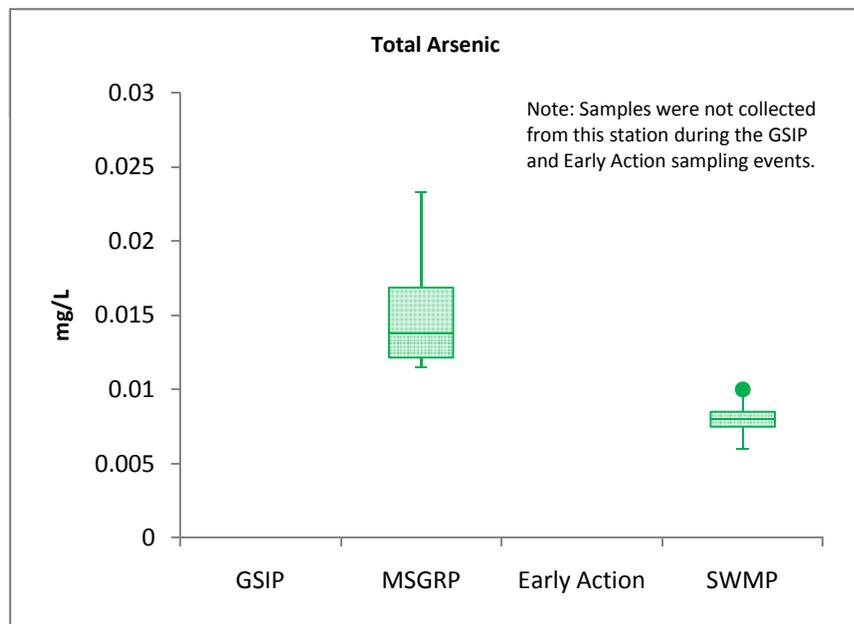
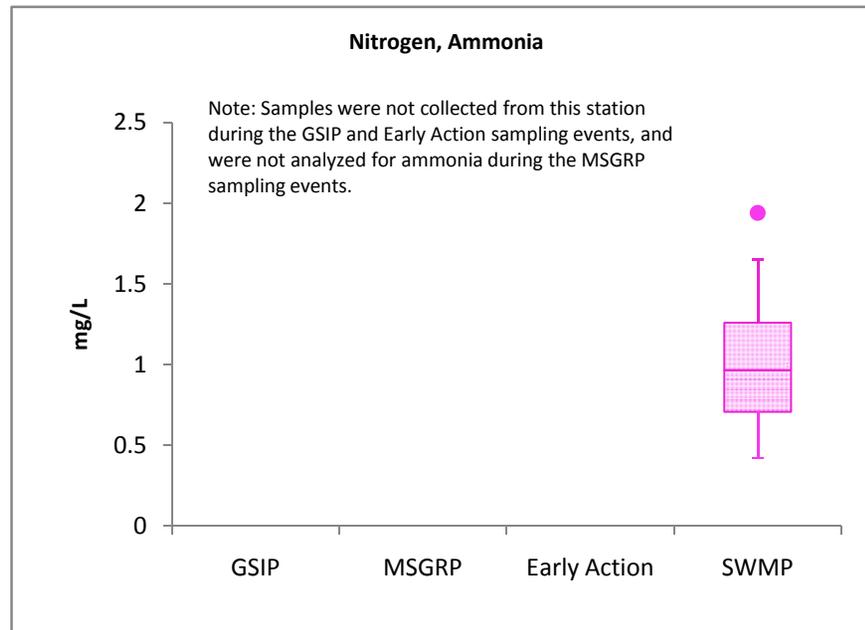
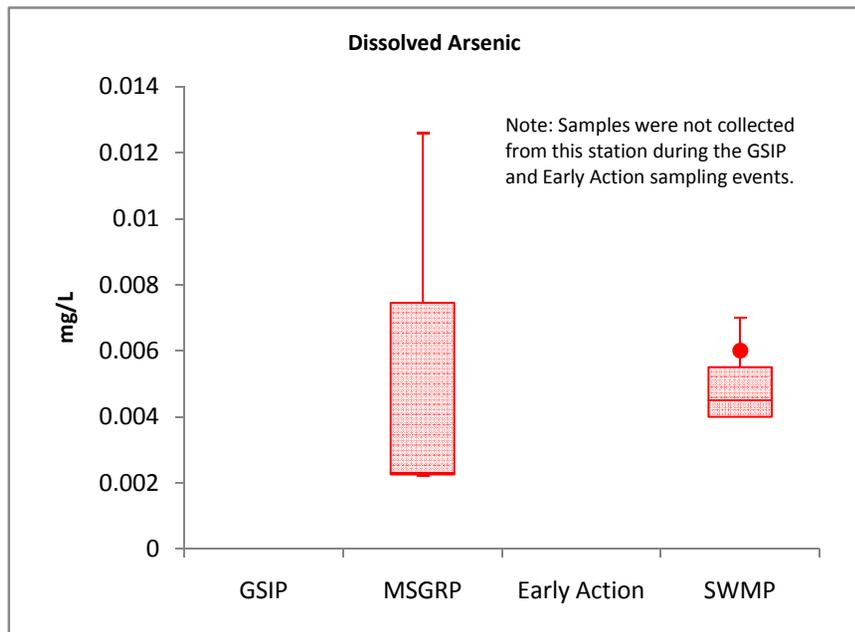




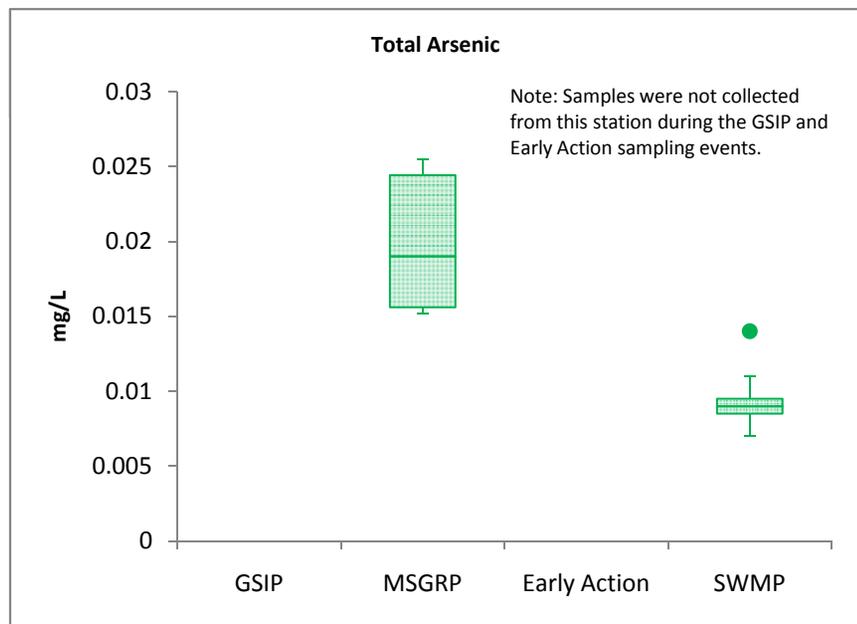
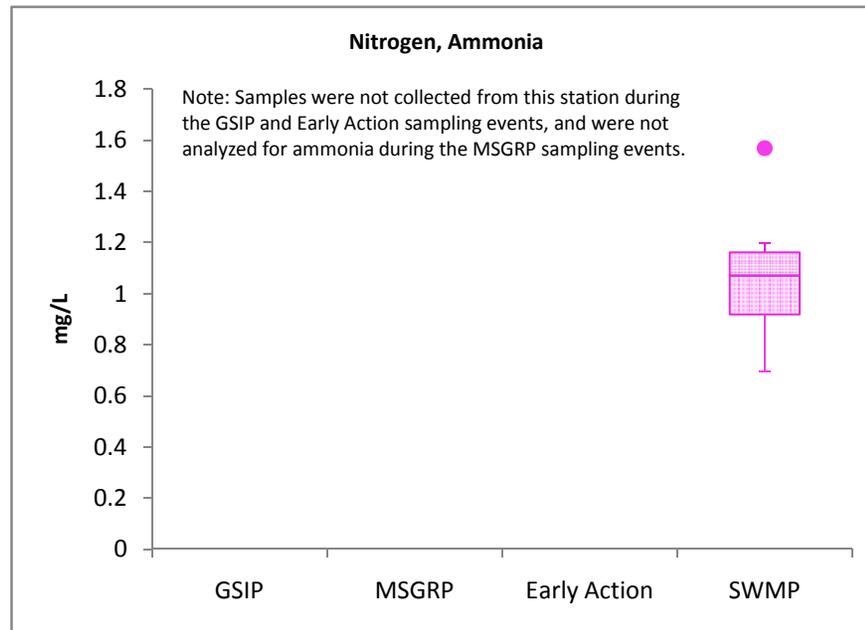
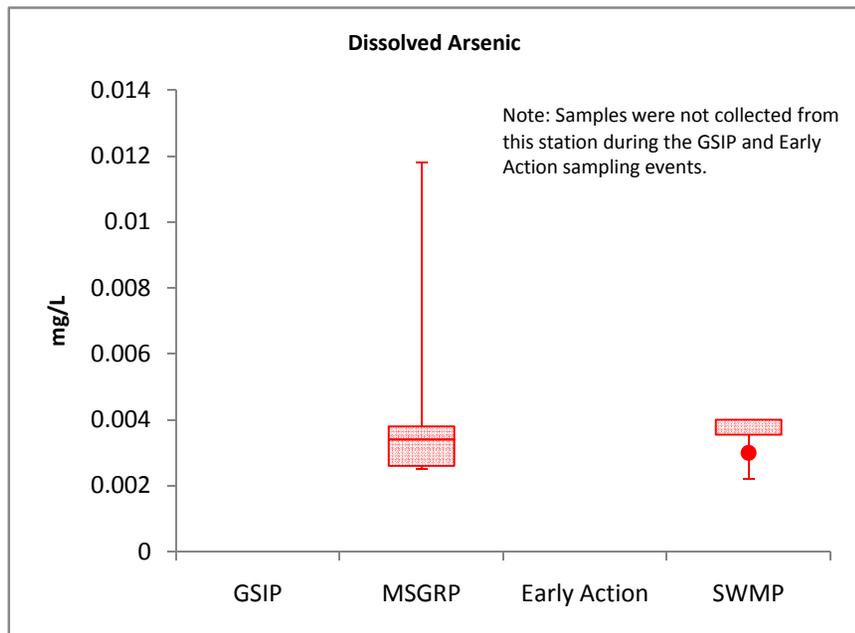


Note: Samples were not collected from this station during the GSIP and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP storm flow samples collected from this station.

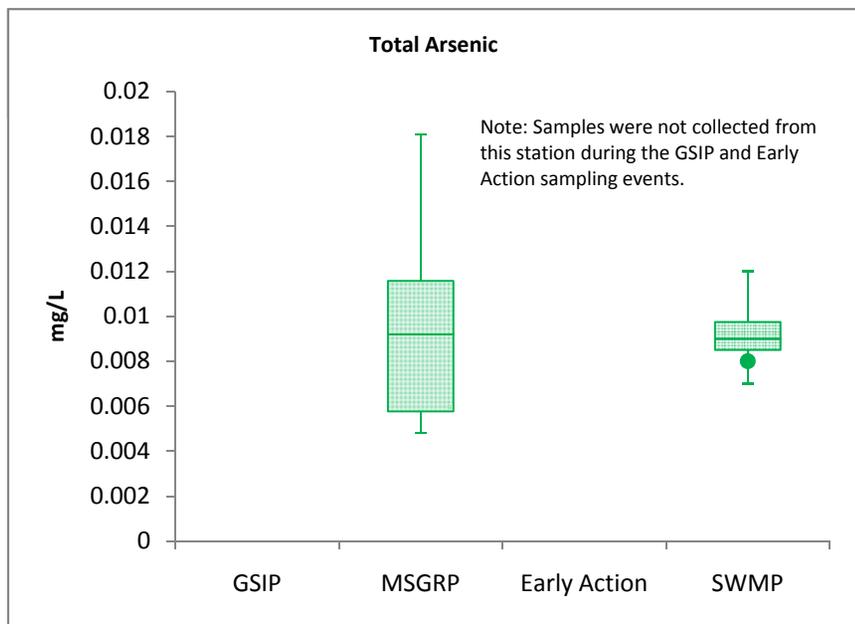
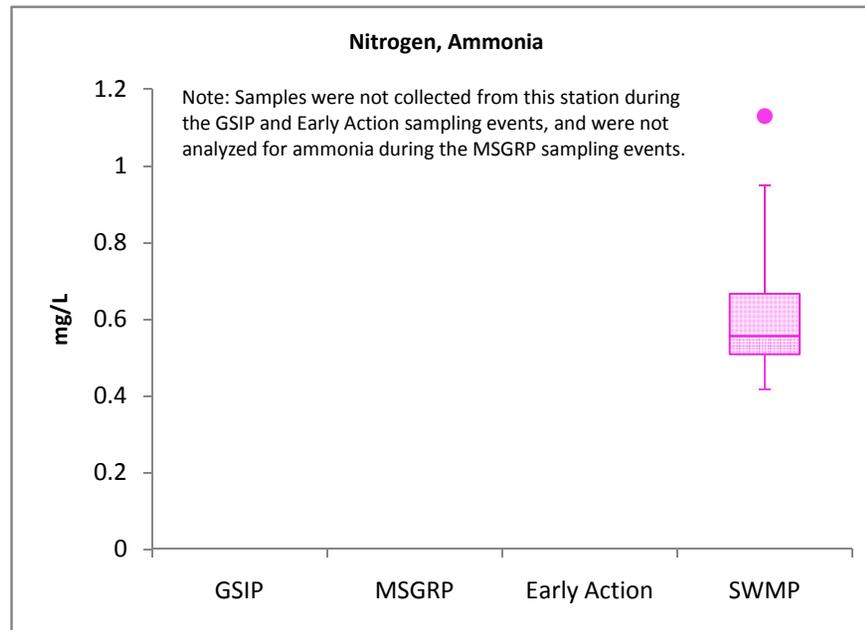
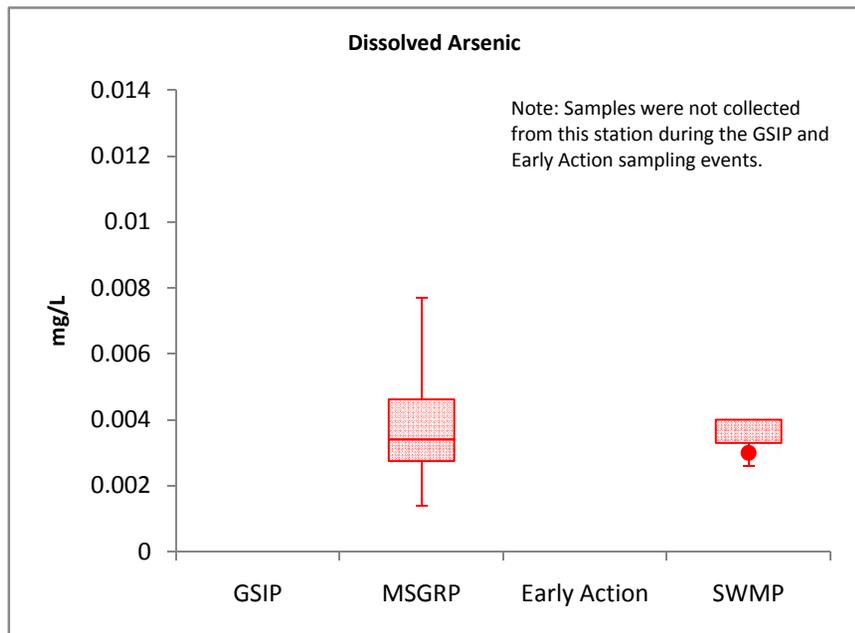




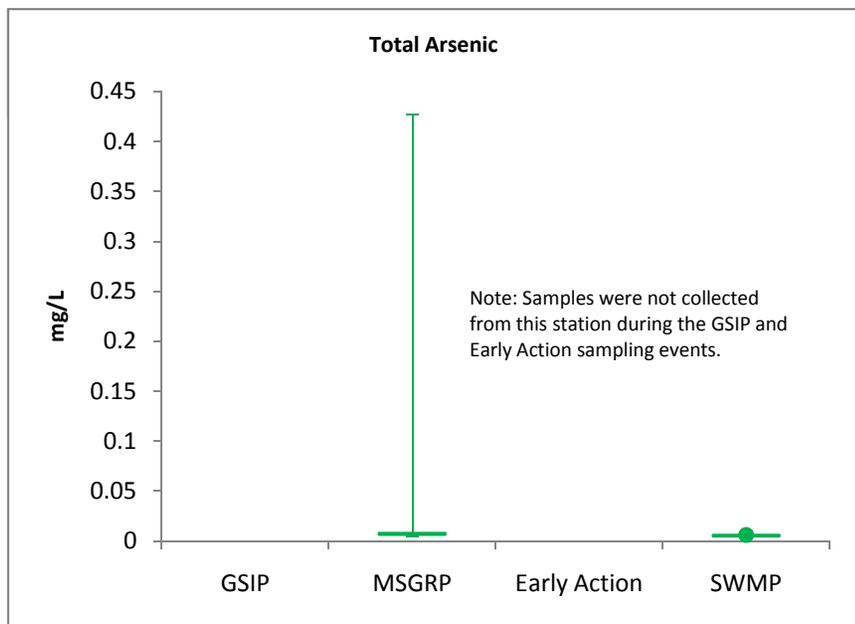
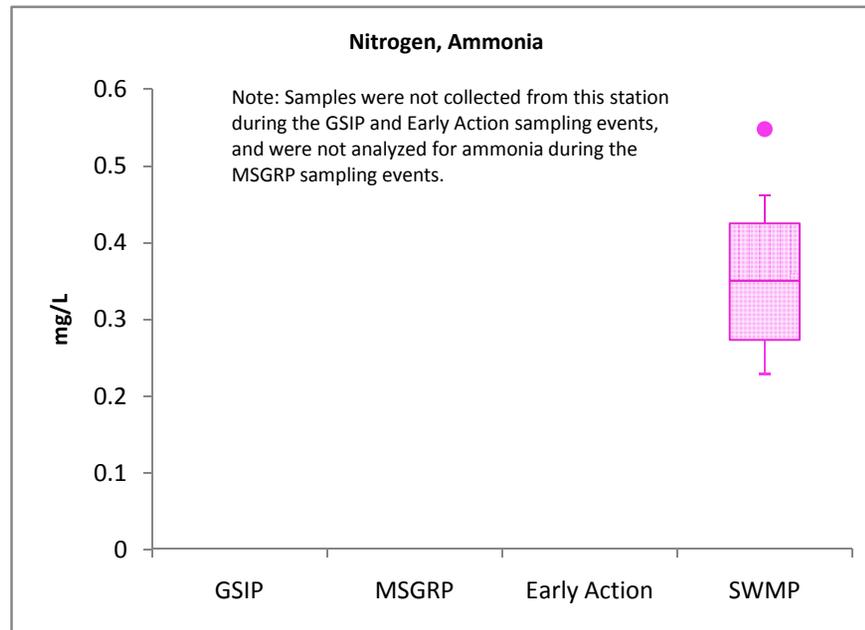
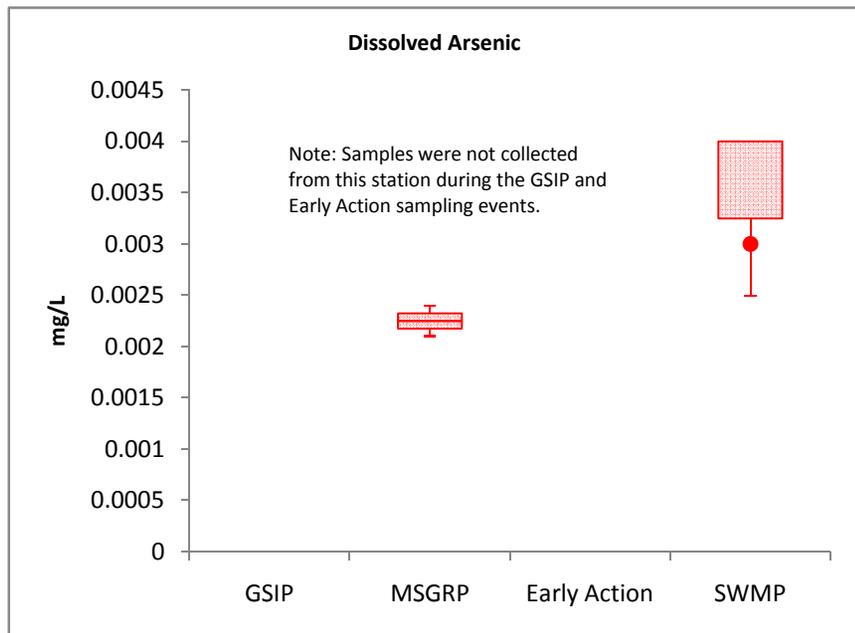
Note: Samples were not collected from this station during the GSIP and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP storm flow samples from this station.



Note: Samples were not collected from this station during the GSIP and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP storm flow samples from this station.



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Note: Samples were not collected from this station during the GSIP and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP storm flow samples from this station.