Response to the Approval of
Stormwater Performance Monitoring in the Los Alamos/Pueblo Watershed during 2011
Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-12-010,
Dated April 16, 2012

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The comments are divided into general and specific categories, as presented in the approval. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment.

GENERAL COMMENTS

NMED Comment

1. *Correlations of flow to SSC and SSC to specific contaminants are provided on a watershed basis in Figures 4.4-1, 4.4-2, and 4.4-3. Most of these comparisons do not show strong correlations. These correlations are more appropriately made on a station by station basis. For all future Stormwater Performance Monitoring Reports (SPMRs), the Permittees must provide these correlations on a station by station basis.*

LANL Response

1. Future stormwater performance monitoring reports (SPMRs) will include these correlations on a station-by-station basis.

NMED Comment

2. *Figure 3.2-4 depicts the time location of the SSC sample collection on the hydrographs for individual sampling events. Marking times of the sample collection on the hydrograph for both SSC and chemical analysis samples is important for interpretation of the data. For all future SPMRs, the Permittees must also include the time locations for collection of the samples for chemical analyses on the hydrographs for individual sampling events.*

LANL Response

2. In future SPMRs, the hydrographs will include the time samples were collected.

NMED Comment

3. *For all future SPMRs, the Permittees must include comparisons of total discharge and mass transport both between stations and from year to year since 2010 at individual stations.*

LANL Response

3. Future SPMRs will include comparisons of total discharge and mass transport between stations and from year to year since 2010 at each station.

NMED Comment

4. *In a response to this Approval with Modifications, provide an evaluation of the success of the sampling strategy implemented in 2011. Specifically, the Permittees must evaluate the effectiveness of the programming that initiated sample collection based on a discharge value that is less than the previous two discharge values. Explain how this strategy compares to a program utilizing a time delay following a specific discharge value.*

LANL Response

4. Based on an analysis of the sampling implemented in 2011, the Laboratory's strategy has been successful. That is, initiating sample collection based on a discharge value that is less than the previous two discharge values generally allowed more of the falling limb of the hydrograph to be captured than initiating sample collection based on a 30-min time delay following the established 5 or 10 cubic feet per second (cfs) threshold (depending on the station). Figure 1 shows all storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square). From Figure 1, the following can be surmised:

    a. E026 – A 30-min lag would have missed most of the two storm events.

    b. E030 – A 30-min lag would have begun 5 to 20 min after sample collection, slightly too late.

    c. E038 – A 30-min lag would have missed sampling two of the six storm events. For three of the other four storm events, a 30-min lag would have missed most of the storm event. For the double peak event on August 19, 2011, a 30-min lag would result in samples being collected at the trough between the two peaks, capturing none of the first peak's falling limb.

    d. E039.1 – A 30-min lag would have missed most of two of the four storm events (August 1 and September 15, 2011). For the event on August 4, a 30-min lag would result in sampling 10 min before samples were collected. For the double peak event on August 19, a 30-min lag would have resulted in samples being collected at the trough between the two peaks, capturing none of the first peak's falling limb.

    e. E042.1 – A 30-min lag would have missed sampling one of the six storm events. For five of the six storm events, 30 min is slightly too long to wait after the peak, and the sample collection strategy used during the monitoring allowed samples to be collected more quickly after the peak.

    f. E050.1 – A 30-min lag would have performed fairly well, with the exception of the September 7 storm event.

    g. E055.5 – A 30-min lag would have completely missed the storm event.

    h. E059 – A 30-min lag would have performed fairly well; however, the strategy used during monitoring allowed samples to be collected closer to the peak.

    i. E109.9 – A 30-min lag would have missed sampling one of the seven storm events (August 26). For three of the seven storm events (July 22, July 28, and August 3), 30 min would have been too long to wait after the peak, and the strategy used during monitoring allowed samples to be

collected more quickly after the peak. For the September 7 storm event, a 30-min lag would have collected before the 10-min delay following the peak. For the August 5 storm event, the sample collection strategy began before the peak because of silting issues in the stilling well. For the September 10 storm event, both strategies would have missed sampling the falling limb of the hydrograph. Note that E109.9 had numerous equipment malfunctions in 2011 because of sediment and ash from the Las Conchas fire.

SPECIFIC COMMENTS

NMED Comment

5. Section 2.1, Sampling at the Detention Basins below the SWMU 01-001(f) Drainage and in Graduation Canyon, page 4

Permittees' Statements: "*In 2011, an automated sampler was used to collect samples from station CO115002 in Graduation Canyon above the confluence with Pueblo Canyon on October 7 and 8 and on October 27. The sampling location is shown in Figure 1.0-1."*

NMED Comment: *There is no sample location icon on Figure 1.0-1 for station CO115002. Correct this in all future SPMRs. Also, in the response to this Approval with Modifications, provide an explanation why this location was not sampled until October, when there was very little precipitation or flow in any of the canyons. It appears that sampling at this location was inadvertently omitted based on the sampling dates and the limited discussion in the Report.*

LANL Response

5. The sampler location icon will be added to the relevant maps in future SPMRs. Sampling at the station in Graduation Canyon was not inadvertently omitted. Installation of the sampler did not occur until September 2011 because Laboratory resources had been deployed to Las Conchas fire recovery efforts. For the 2012 monitoring season, the sampler will be engaged by June 1.

NMED Comment

6. Section 4.1, Data Exceptions, page 19, 2nd paragraph

Permittees' Statement: *When the SSC was over 5000 mg/L and analytical techniques were not adjusted appropriately to compensate for the increased solid component, americium-241, isotopic plutonium, and isotopic uranium activities were underreported.*

NMED Comment*: Adjust all future elevated SSC results properly to prevent underreporting.*

LANL Response

6. The Laboratory is working with the analytical laboratories to understand the potential issues associated with high solids samples and to mitigate the effects of high solids content on future sample analyses. Any findings will be communicated to NMED.

NMED Comment

7. Table 4.2-2 Maximum Detected Results By Station and Event above Comparison Values in LA/P Stormwater Samples in 2011, pages 160 and 161

Review the listed 2,3,7,8-TCDD TEQ. Six TEQs differed with those shown on Table 4.2-2.

LANL Response

7. Tables 4.2-2 and 4.2-5 have been revised to include updated 2,3,7,8-tetrachlorodibenzodioxin (TCDD) toxic equivalency quotients (TEQs). In the seven samples with misreported TEQs, 2,3,7,8-TCDD was analyzed twice and two sets of usable results were reported by the analytical laboratory. Both sets of 2,3,7,8-TCDD results were inadvertently included in the TEQ calculation, producing incorrectly elevated TEQ. Corrected TEQs are reported below in revised Tables 4.2-2 and 4.2-5.

Table 4.2-2
Maximum Detected Results by Station and Event
above Comparison Values in LA/P Stormwater Samples in 2011

Station	Collection Date	Aluminum	Arsenic	Copper	Manganese	Mercury	Selenium	Cyanide (Total)	2,3,7,8-TCDD TEQ	Total PCBs	Gross alpha	Radium-226 and Radium-228
Comparison Values[a]		**658**	**9**	**4.3**	**2000**	**0.8**	**5**	**5.2**	**0.000000051**	**0.00064**	**15**	**30**
Field Preparation		**F**[b]	**F**	**F**	**F**	**UF**[c]	**UF**	**UF**	**UF**	**UF**	**UF**	**UF**
CO101038	10/2/2011	—[d]	—	—	—	—	—	NA[e]	NA	0.0116	37.9	NA
CO111041	8/19/2011	—	—	—	—	—	—	NA	NA	9.07	41.3	NA
CO115002	10/7/2011	960	—	—	—	—	—	NA	NA	0.00363	—	NA
CO115002	10/27/2011	—	—	—	—	—	—	NA	NA	0.00673	—	NA
E026	8/22/2011	—	—	—	3990	—	6.9	41	4.14E-07	0.295	3790	NA
E026	9/4/2011	—	—	—	—	—	—	48	8.43E-06	0.155	2190	NA
E030	8/21/2011	1170	—	—	—	—	—	8.8	1.79E-06	0.0757	35.6	NA
E030	8/22/2011	—	—	—	3100	—	—	24	1.02E-05	0.953	6200	NA
E030	9/4/2011	—	—	—	4500	2.6	—	75	6.89E-06	0.232	2970	NA
E030	10/2/2011	—	—	—	—	—	11.1	32	7.77E-07	0.0255	329	NA
E038	7/2/2011	—	—	—	—	—	—	NA	1.48E-06	0.101	50.6	NA
E038	7/28/2011	—	—	5	—	—	—	NA	1.09E-07	0.0426	16.2	NA
E038	8/2/2011	—	—	6.4	—	—	—	NA	—	0.0191	—	NA
E038	8/13/2011	—	—	10	—	—	—	NA	—	0.00924	19.6	NA
E038	8/19/2011	—	—	—	—	—	—	NA	2.02E-07	0.0244	16.4	NA
E038	9/1/2011	—	—	—	—	—	—	NA	NA	NA	—	NA
E038	9/4/2011	—	—	—	—	—	—	NA	—	0.0111	—	NA
E039.1	8/1/2011	1050	—	5.8	—	—	—	NA	NA	NA	—	NA
E039.1	8/4/2011	715	—	—	—	—	—	NA	8.91E-08	0.0177	—	NA

Table 4.2-2 (continued)

Station	Collection Date	Aluminum	Arsenic	Copper	Manganese	Mercury	Selenium	Cyanide (Total)	2,3,7,8-TCDD TEQ	Total PCBs	Gross alpha	Radium-226 and Radium-228
Comparison Values[a]		**658**	**9**	**4.3**	**2000**	**0.8**	**5**	**5.2**	**0.000000051**	**0.00064**	**15**	**30**
Field Preparation		**F**[b]	**F**	**F**	**F**	**UF**[c]	**UF**	**UF**	**UF**	**UF**	**UF**	**UF**
E039.1	8/19/2011	805	—	—	—	—	—	NA	1.16E-07	0.0219	16.3	NA
E039.1	9/15/2011	—	—	—	—	—	—	NA	—	0.0127	—	NA
E042.1	8/19/2011	1770	—	—	—	—	—	NA	1.46E-07	0.15	NA	NA
E042.1	8/22/2011	—	—	5	2430	—	—	51	3.04E-05	0.667	2540	NA
E042.1	9/4/2011	—	—	—	2070	—	17.4	48	7.12E-07	0.34	3090	66.8
E042.1	9/7/2011	—	—	—	—	—	—	15	7.71E-08	0.025	426	—
E042.1	10/2/2011	—	—	—	—	—	—	17	1.10E-07	0.0218	1420	NA
E042.1	10/4/2011	—	—	—	—	—	—	17	6.65E-06	0.0588	340	—
E050.1	8/21/2011	1330	—	—	—	—	—	—	3.50E-06	0.213	63.3	—
E050.1	8/22/2011	—	—	—	2390	—	8.2	31	7.8E-06	0.406	2880	—
E050.1	9/4/2011	—	—	—	—	—	7.8	21	2.93E-06	0.206	579	50.3
E050.1	9/7/2011	—	—	—	—	—	—	8.1	1.65E-06	0.0231	153	—
E050.1	9/10/2011	—	—	—	—	—	—	—	1.34E-07	0.0393	36.7	—
E050.1	9/15/2011	—	—	—	—	—	—	—	1.44E-07	0.0408	22.1	—
E050.1	10/2/2011	—	—	—	—	—	—	13	5.85E-08	0.0126	373	—
E050.1	10/4/2011	—	—	—	—	—	—	9.2	9.27E-08	0.0185	110	—
E055.5	8/19/2011	NA	NA	NA	NA	NA	NA	NA	NA	0.0604	NA	NA
E059	8/19/2011	1070	—	—	—	—	—	6	NA	NA	300	—
E059	8/21/2011	NA	NA	NA	NA	NA	NA	NA	3.02E-05	1.72	NA	NA
E109.9	7/22/2011	n/a[f]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E109.9	7/28/2011	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E109.9	8/3/2011	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E109.9	8/5/2011	—	10.1	—	4380	—	7.9	NA	4.08E-07	0.000723	5140	63.3
E109.9	8/22/2011	—	—	4.8	—	—	—	168	—	0.266	1100	109
E109.9	8/26/2011	—	—	—	2990	—	10.5	91	1.35E-05	0.302	2510	NA
E109.9	9/4/2011	—	—	—	2950	—	—	NA	NA	NA	4460	NA
E109.9	9/7/2011	—	—	—	—	—	—	—	—	0.00564	587	NA
E109.9	9/10/2011	—	—	—	—	—	—	13	5.32E-06	0.0494	810	57.6

Note: All units are µg/L, except gross alpha, radium-226, and radium-228 are in pCi/L.

[a] Hardness-dependent comparison values based on 30 mg $CaCO_3$/L hardness.

[b] F = Filtered.

[c] UF = Unfiltered.

[d] — = Analyte was not detected above comparison value.

[e] NA = Not analyzed.

[f] n/a = Not available; sediment content was too high for standard water analysis, and instead the sample was analyzed as sediment.

Table 4.2-5
Dioxin and Furan TEQs in 2011 Stormwater Samples

Station	Collection Date and Time	Sample ID	2,3,7,8-TCDD TEQ (µg/L)
E026	8/22/11 12:57	WTLAP-11-15117	4.14E-07
E026	9/4/11 18:03	WTLAP-11-15112	8.43E-06
E030	8/21/11 16:41	WTLAP-11-15147	1.79E-06
E030	8/22/11 14:11	WTLAP-11-15160	1.02E-05
E030	9/4/11 19:11	WTLAP-11-15148	6.89E-06
E030	10/2/11 15:26	WTLAP-11-15150	7.77E-07
E038	7/2/11 17:52	WTLAP-11-14894	1.48E-06
E038	7/28/11 14:41	WTLAP-11-14893	1.09E-07
E038	8/2/11 22:41	WTLAP-11-14895	0
E038	8/13/11 16:05	WTLAP-11-14892	0
E038	8/19/11 13:45	WTLAP-11-26020	2.02E-07
E038	9/4/11 18:15	WTLAP-11-26022	5.10E-08
E039.1	8/4/11 16:49	WTLAP-11-15080	8.91E-08
E039.1	8/19/11 14:23	WTLAP-11-14992	1.16E-07
E039.1	9/15/11 18:42	WTLAP-11-15053	4.14E-08
E042.1	8/19/11 16:06	WTLAP-11-15710	1.46E-07
E042.1	8/22/11 14:41	WTLAP-11-15712	3.04E-05
E042.1	9/4/11 19:47	WTLAP-11-15709	7.12E-07
E042.1	9/7/11 14:57	WTLAP-11-15711	7.71E-08
E042.1	10/2/11 17:14	WTLAP-11-27750	1.10E-07
E042.1	10/4/11 22:18	WTLAP-11-27841	6.65E-06
E050.1	8/21/11 18:35	WTLAP-11-15739	3.50E-06
E050.1	8/22/11 16:34	WTLAP-11-15759	7.80E-06
E050.1	9/4/11 21:45	WTLAP-11-15750	2.93E-06
E050.1	9/7/11 12:50	WTLAP-11-15735	1.65E-06
E050.1	9/10/11 1:55	WTLAP-11-27471	1.34E-07
E050.1	9/15/11 20:10	WTLAP-11-27472	1.44E-07
E050.1	10/2/11 17:14	WTLAP-11-27473	5.85E-08
E050.1	10/4/11 23:40	WTLAP-11-27474	9.27E-08
E059	8/21/11 16:27	WTLAP-11-15809	3.02E-05
E109.9	8/5/11 17:51	WTLAP-11-15889	4.08E-07
E109.9	8/22/11 15:39	WTLAP-11-26560	0
E109.9	8/26/11 17:15	WTLAP-11-26561	1.35E-05
E109.9	9/7/11 16:36	WTLAP-11-26555	0
E109.9	9/10/11 2:10	WTLAP-11-26559	5.32E-06

NMED Comment

8. Data Disc, LA-P 2011 Stormwater data.xlsx and LA-P 2011 Sediment data.xlsx

Include a column in these two spreadsheets specifying the Station ID for the samples. The Permittees must provide a revised version of the tables to NMED in the response with the Station ID columns included.

LANL Response

8. The files provided in Appendix B, LA-P 2011 Stormwater data.xlsx and LA-P 2011 Sediment data.xlsx, have been revised to include station IDs. They are included in Attachment 1 of this response.

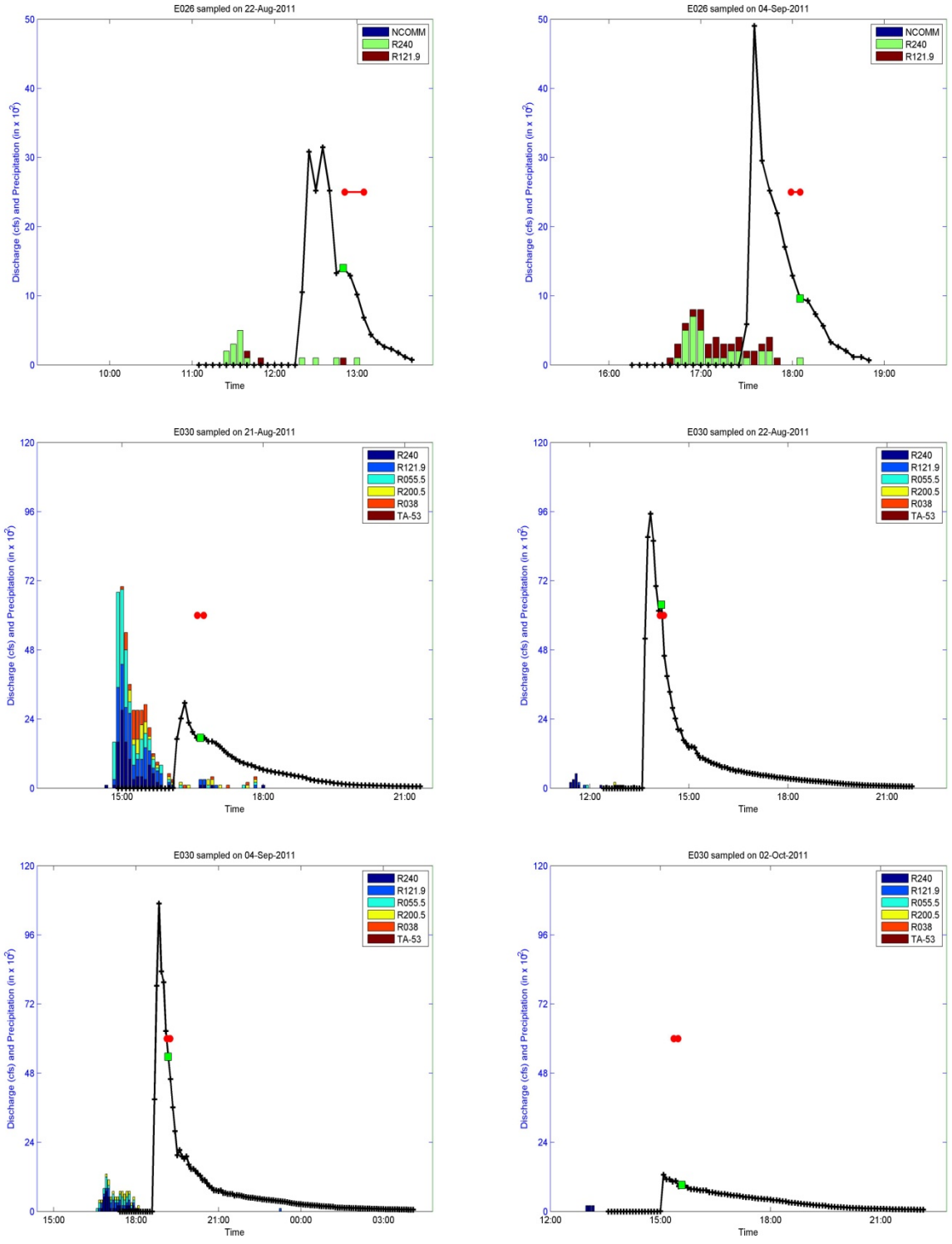

Figure 1 **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

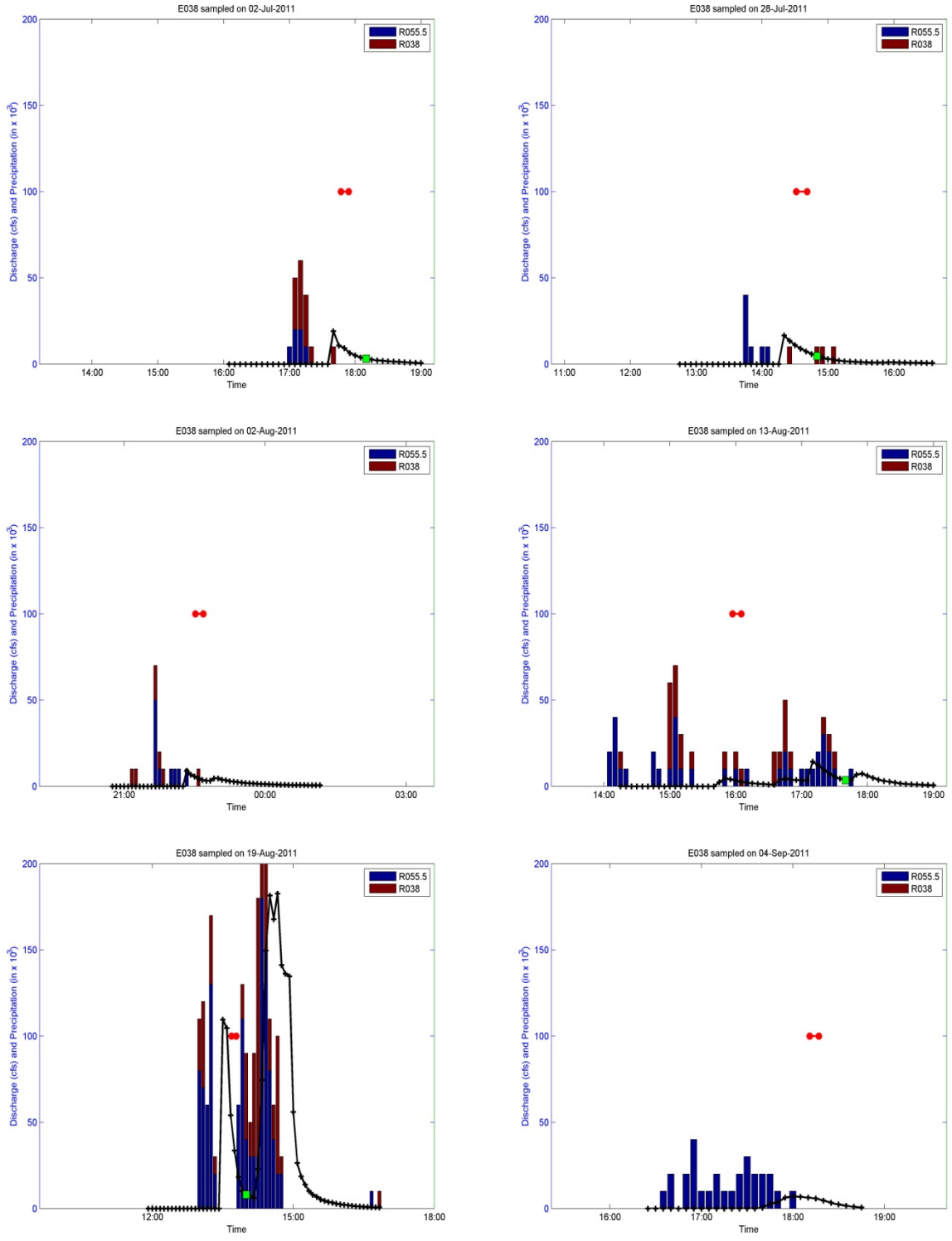

Figure 1 (continued) **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

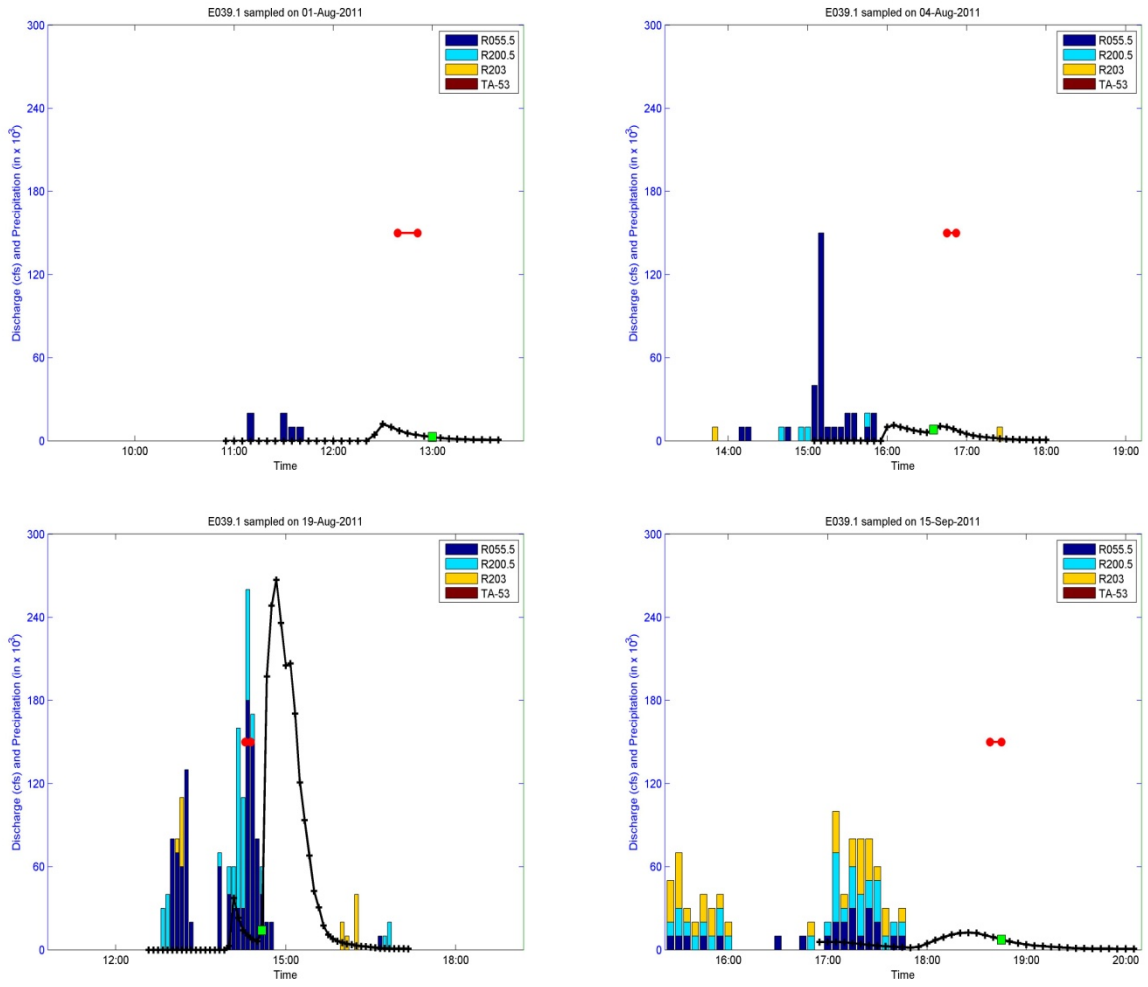

Figure 1 (continued) **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

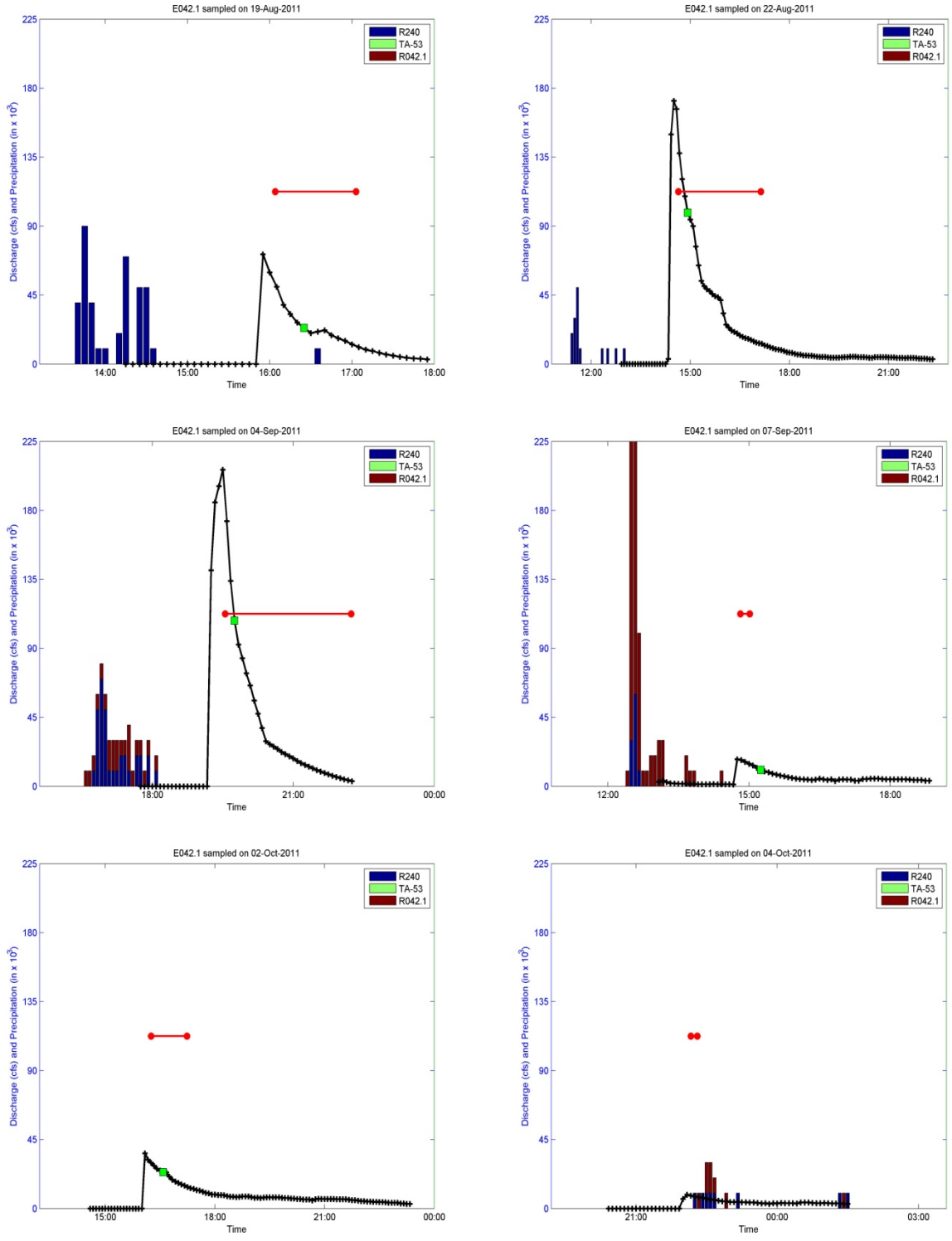

Figure 1 (continued) **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

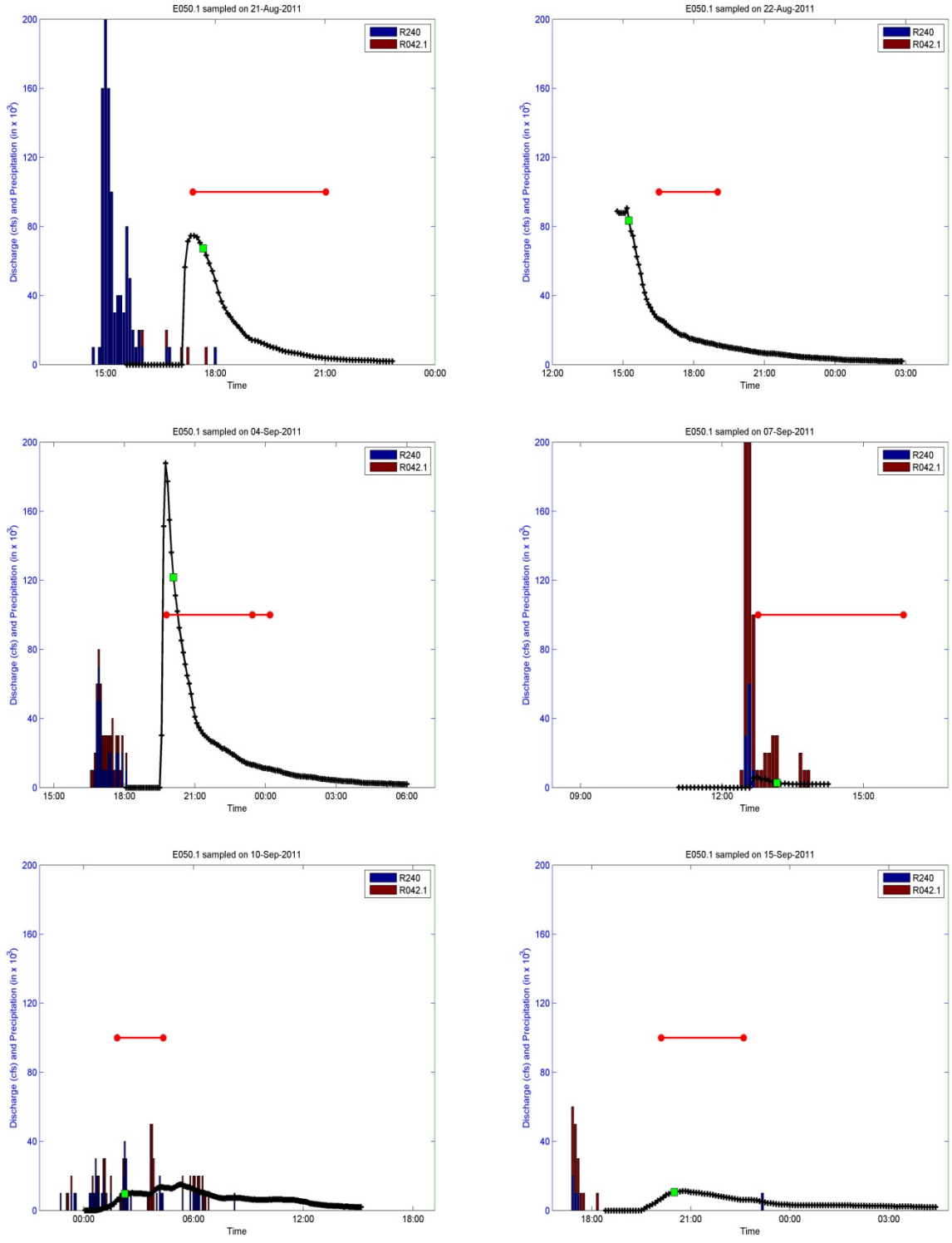

Figure 1 (continued) **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

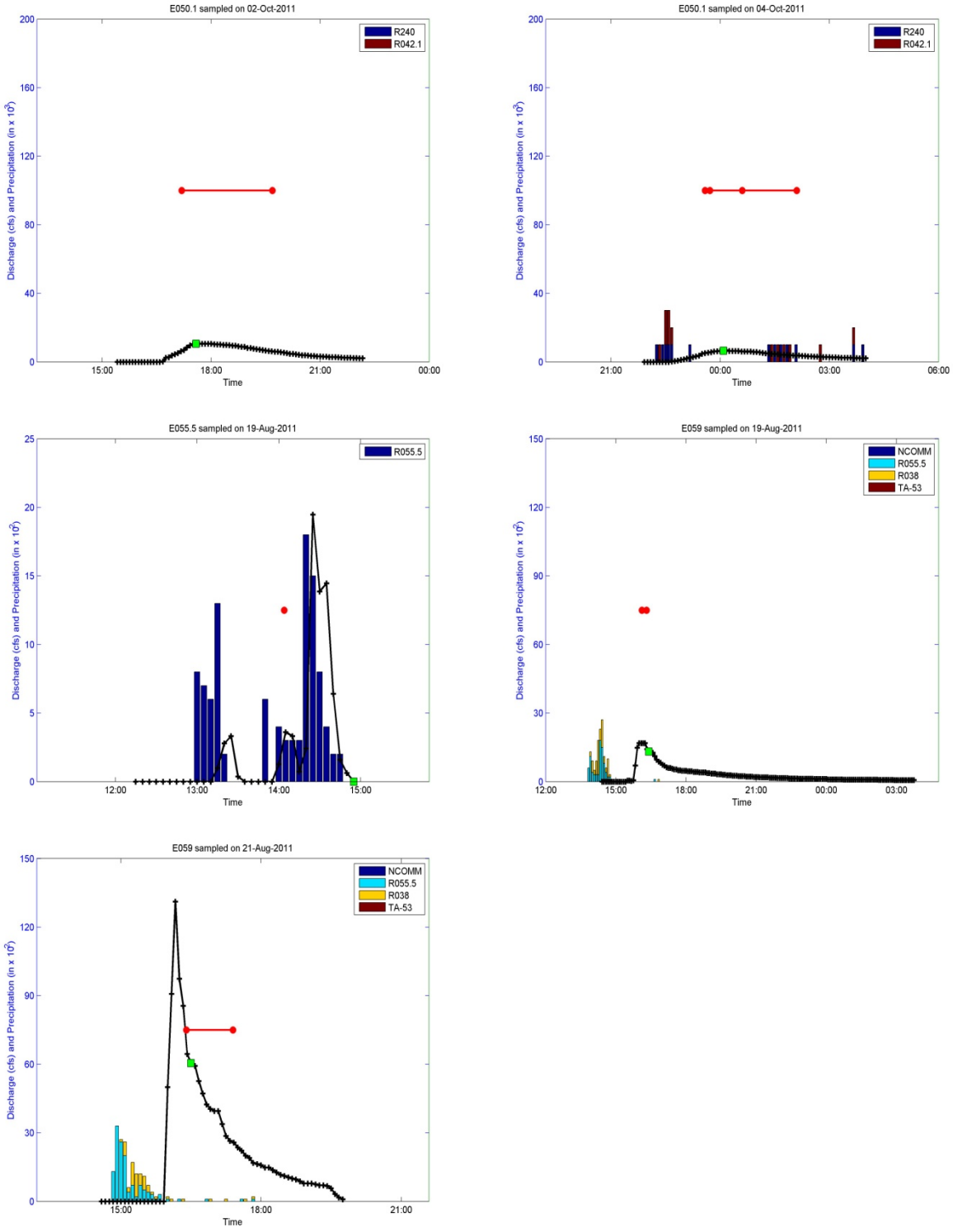

Figure 1 (continued) **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

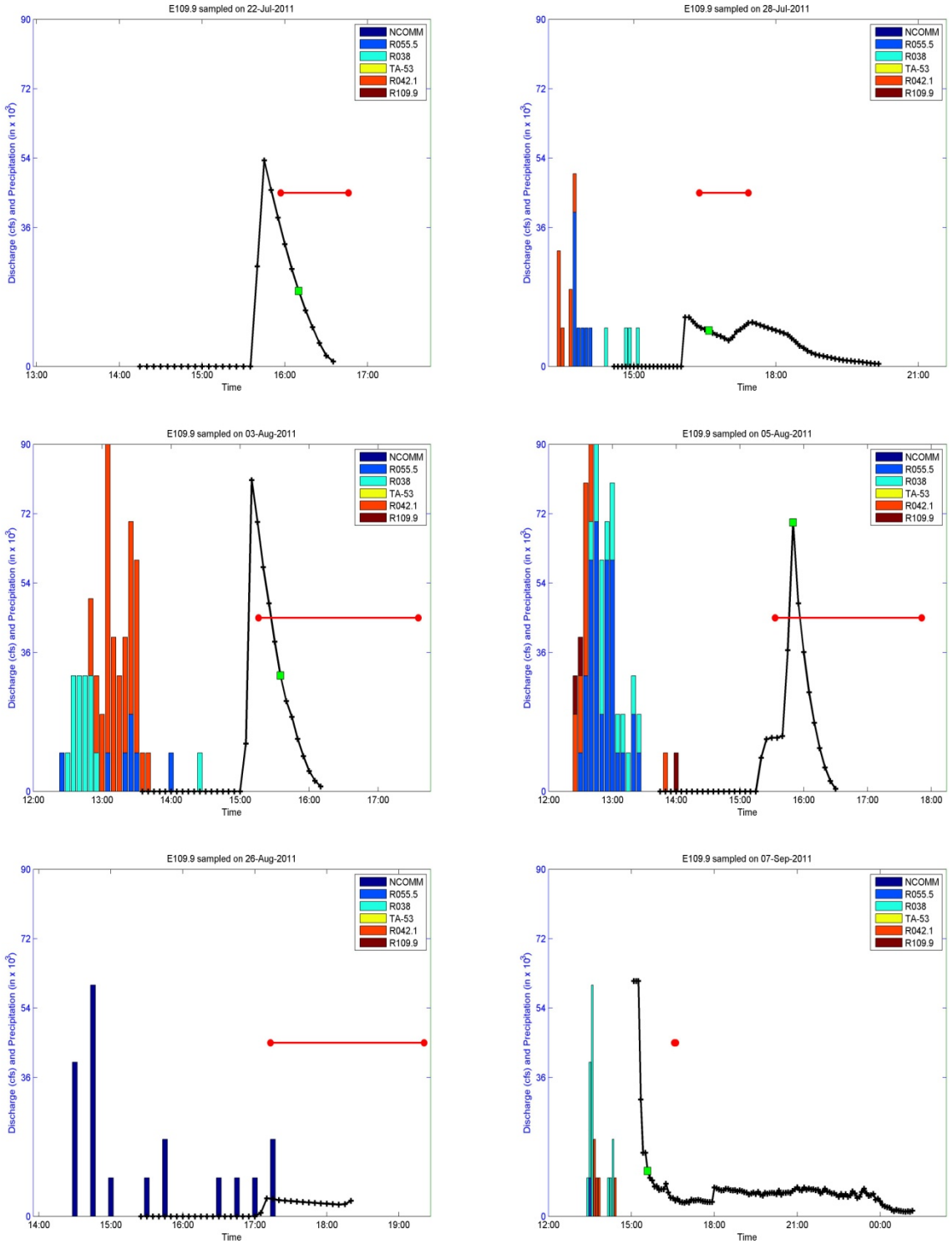

Figure 1 (continued) **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

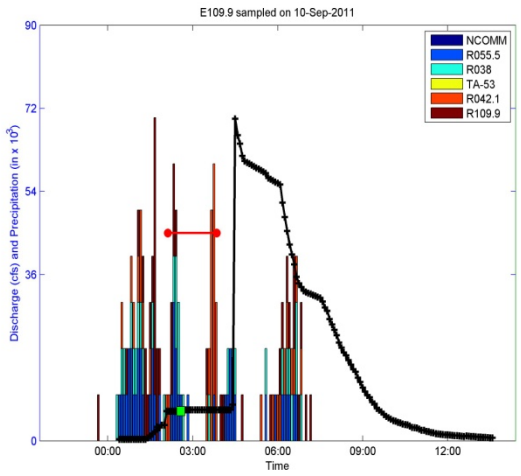

Figure 1 (continued) **Storm events sampled in 2011, including the measured discharge (black crosses), the beginning and end of sample collection (red circles), and the point 30 min past the 5 or 10 cfs threshold (green square)**

Attachment 1

Appendix B Replacement Tables
(on CD included with this document)