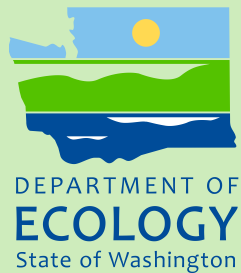


Appendix D. Data Tables

Roofing Materials Assessment: Investigation of Toxic Chemicals in Roof Runoff



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Publication and Contact Information

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For more information contact:

Publications Coordinator
Environmental Assessment Program
Washington State Department of Ecology
P.O. Box 47600, Olympia, WA 98504-7600
Phone: (360) 407-6764

Authors:

Nancy L. Winters
Environmental Assessment Program
and
Kyle Graunke
Water Quality Program

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Table 1. Rain event data in English units.

Event Number	1	2	3	4	5	6	7	8	9	10
Event Date(s)	2/21 - 2/22	2/24 - 2/25	2/27 - 2/28	3/5 - 3/6	3/11 - 3/12	3/12 - 3/13	3/19 - 3/20	4/4 - 4/5	4/10	4/18 - 4/19
Sample Event Duration (hrs) ^a	23.25	9.5	15.5	16.15	9.25	16.75	13.25	17	2.75	17.75
Precipitation in 6 Hours Preceding Event (in.) ^b	0.03	0.0	0.07	0.01	0.01	0.03	0	0.09	0	0
Hours Preceding Event with No Measurable Precipitation ^b	0.5	31.5	0	0	0	0.25	30	0.25	66.5	46.75
Total Precipitation (in.) ^b	0.65	0.30	0.53	0.18	0.17	0.20	0.71	0.74	0.40	0.30
Average Rain Intensity (in./hr.) ^b	0.028	0.032	0.034	0.011	0.018	0.012	0.054	0.044	0.145	0.017
Average Rain Intensity when Rain Falling (in./hr.) ^b	0.096	0.067	0.062	0.051	0.052	0.047	0.065	0.78	0.145	0.0462
Peak Rain Intensity (in./15 min.) ^b	0.06	0.03	0.03	0.02	0.02	0.02	0.04	0.05	0.06	0.02
Minimum Rain Intensity (in./15 min.) ^b	0	0	0	0	0	0	0	0	0.01	0
Average Wind Speed during Event (mph) ^c	ND	3.9	0.1	0.1	1.4	1.0	0.3	1.5	3.9	2.2
Highest Wind Gusts (mph) ^c	ND	17.0	3	4	3	11	9	16	16	14
Average Wind Direction during Event (°F) ^c	ND	206	261	310	174	188	206	185	197	175
Average Wind Direction when Rain Falling ^c	ND	197	68	284	166	190	204	183	197	178
Average Temperature (°F) ^d	41.6	40.2	44.2	41.3	47.8	49.6	44.3	52.5	51.1	49.4
Low Temperature (°F) ^d	39.9	35.6	44.1	39.9	46.4	48.9	43.0	51.1	50.0	48.2
High Temperature (°F) ^d	42.8	48.0	46.0	43.0	50.0	51.1	48.9	55.9	52.0	52.0

a Rain event duration = (Event stop time and date) - (event start time and date)

b Data from tipping bucket rain gage co-located with roofing panels at the Department of Ecology Lacey, Washington

c Wind speed and direction data obtained from Weather Underground (www.wunderground.com) for station KWALACEY6.

d Temperature data from Olympia Airport (MesoWest <http://mesowest.utah.edu/cgi-bin/droman/mesomap.cgi?state=WA&rawsflag=3>)

ND No data

Table 2. Rain event data in metric units.

Event Number	1	2	3	4	5	6	7	8	9	10
Event Date(s)	2/21 - 2/22	2/24 - 2/25	2/27 - 2/28	3/5 - 3/6	3/11 - 3/12	3/12 - 3/13	3/19 - 3/20	4/4 - 4/5	4/10	4/18 - 4/19
Sample Event Duration (hrs) ^a	23.25	9.5	15.5	16.15	9.25	16.75	13.25	17.0	2.75	17.75
Precipitation in 6 Hours Preceding Event (mm) ^b	0.762	0.0	1.778	0.254	0.254	0.762	0.0	2.286	0.0	0.0
Hours Preceding Event with No Measurable Precipitation ^b	0.5	31.5	0.0	0.0	0.0	0.25	30	0.25	66.5	46.75
Total Precipitation (mm) ^b	16.51	7.61	13.46	4.57	4.31	5.08	18.03	18.8	10.16	7.61
Average Rain Intensity (mm./hr.) ^b	0.710	0.801	0.868	0.283	0.467	0.303	1.361	1.106	3.695	0.429
Average Rain Intensity when Rain Falling (mm/hr.) ^b	2.45	1.69	1.58	1.31	1.33	1.20	1.64	1.98	3.69	1.17
Peak Rain Intensity (mm/15 min.) ^b	1.52	0.76	0.76	0.51	0.51	0.51	1.02	1.27	1.52	0.51
Minimum Rain Intensity (mm/15 min.) ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.254	0.0
Average Wind Speed during Event (km/h) ^c	ND	6.2	0.2	0.2	2.2	1.5	0.5	2.5	6.2	3.5
Highest Wind Gusts (km/h) ^c	ND	26	5	6	5	17	14	24	24	21
Average Wind Direction during Event (°C) ^c	ND	206	261	310	174	188	206	185	197	175
Average Wind Direction when Rain Falling ^c	ND	197	68	284	166	190	204	183	197	178
Average Temperature (°C) ^d	5.3	4.6	6.8	5.2	8.8	9.8	6.9	11.4	10.6	9.7
Low Temperature (°C) ^d	4.4	2.0	6.7	4.4	8.0	9.4	6.1	10.6	10.0	9.0
High Temperature (°C) ^d	6.0	8.9	7.8	6.1	10.0	10.6	9.4	13.3	11.1	11.1

- a Rain event duration = (Event stop time and date) - (event start time and date)
- b Data from tipping bucket rain gage co-located with roofing panels at the Department of Ecology Lacey, Washington
- c Wind speed and direction data obtained from Weather Underground (www.wunderground.com) for station KWALACEY6.
- d Temperature data from Olympia Airport (MesoWest <http://mesowest.utah.edu/cgi-bin/droman/mesomap.cgi?state=WA&rawsflag=3>)
- ND No data

Table 3. pH of panel runoff at time of sampling from the 10 rain events.

Event #	Steep-Slope Panels								Low-Slope Panels							
	AAR	AS ^A	CPR	CTI	PAZ	TWO	WOS	GST	BUA	BUR	BUS	EPD	PVC	TPO	ZIN	GLO
1	6.6	6.9	5.9	9.1	5.4	5.1	5.6	5.3	6.7	6.9	7.1	5.0	5.0	6.1	5.2	5.2
2	7.7	6.7	6.4	8.1	6.2	5.0	3.8	5.0	6.1	6.7	7.4	4.9	5.2	7.0	5.1	4.6
3	7.0	6.8	6.6	8.1	4.8	4.4	3.7	4.7	6.5	7.2	7.3	5.1	5.2	6.0	5.9	5.2
4	6.2	7.3	6.2	7.2	5.3	4.8	4.3	4.8	5.7	6.1	7.3	4.5	5.0	5.6	5.1	5.0
5	6.5	6.5	5.0	8.0	4.3	4.6	3.6	4.7	6.2	6.6	6.2	4.4	4.7	6.7	5.2	5.6
6	7.2	7.1	6.4	7.8	4.6	4.7	3.5	4.5	6.3	6.8	7.3	4.2	4.6	5.8	5.6	4.9
7	5.9	6.5	5.8	7.2	5.1	4.3	3.7	4.7	5.4	6.4	5.8	4.6	4.6	5.8	5.7	5.0
8	6.2	6.5	4.9	7.2	4.8	4.5	4.0	5.8	5.8	5.8	6.0	4.7	4.8	5.8	4.8	4.7
9 ^a	8.1	4.8	7.1	8.6	4.5	4.6	5.4	6.3	7.1	6.1	5.3	4.4	4.9	7.2	5.0	6.8
10	7.0	6.9	5.6	7.0	4.9	4.9	4.3	6.0	5.3	6.2	6.5	4.4	5.0	5.8	4.1	4.7

^a During rain event 9, pH meter drifted, Data were not included in median values.

Table 4. Temperature (in °C) of panel runoff from the 10 rain events.

Event #	Steep-Slope Panels								Low-Slope Panels							
	AAR	AS ^A	CPR	CTI	PAZ	TWO	WOS	GST	BUA	BUR	BUS	EPD	PVC	TPO	ZIN	GLO
1	3.4	3.7	3.5	3.5	3.7	3.7	4.2	4.0	4.3	4.2	3.7	4.8	4.6	4.7	4.5	5.2
2	4.2	3.9	4.7	3.6	3.1	4.5	2.7	4.4	4.9	3.7	3.1	4.2	3.3	2.8	2.7	5.3
3	5.4	4.6	5.9	5.1	4.8	4.8	5.0	5.5	5.2	4.8	5.2	5.8	6.4	5.9	7.4	5.0
4	3.2	3.5	2.5	1.8	2.9	3.2	3.5	1.6	1.0	2.4	2.8	1.9	2.0	1.4	2.6	1.7
5	6.1	7.0	7.3	4.6	9.6	6.4	6.1	6.0	3.7	5.1	4.2	4.5	7.2	5.1	6.5	4.6
6	8.6	7.9	8.6	9.0	8.6	8.5	8.1	9.0	6.9	8.6	7.6	9.0	8.5	7.2	9.4	7.4
7	6.9	7.0	7.2	6.6	7.8	7.4	7.0	6.4	5.3	8.1	5.5	6.6	6.3	10.9	6.3	6.7
8	10.3	10.7	10.7	10.9	10.7	10.6	10.8	10.5	9.4	9.4	9.2	10.2	9.5	10.3	9.4	10.2
9	5.9	7.9	6.4	6.6	6.6	5.9	7.4	6.4	6.6	7.6	8.7	8.1	8.8	6.7	9.8	10.5
10	10.9	11.3	11.0	11.4	11.2	11.4	11.5	11.0	10.2	10.6	10.9	11.3	11.7	11.2	10.9	11.5

Table 5. Specific conductance (uS/cm) of panel runoff from the 10 rain events.

Event #	Steep-Slope Panels							Low-Slope Panels								
	AAR	AS ^A	CPR	CTI	PAZ	TWO	WOS	GST	BUA	BUR	BUS	EPD	PVC	TPO	ZIN	GLO
1	15	14	11	63	6	15	108	6	6	20	6	13	13	6	4	6
2	13	15	6	64	16	24	117	10	11	25	9	10	7	16	15	13
3	3	4	2	28	3	7	38	4	0	2	11	1	1	0	2	0
4	9	9	8	82	2	18	84	0	5	5	6	7	4	4	41	3
5	21	23	4	116	6	21	175	5	9	17	16	25	8	9	8	2
6	13	13	4	61	6	9	83	4	10	21	14	17	13	5	5	17
7	6	13	8	44	0	3	76	0	0	1	0	4	0	0	2	0
8	4	3	1	18	10	2	32	0	1	5	5	1	0	0	0	0
9	4	7	0	28	1	4	51	0	0	3	1	5	0	0	0	0
10	14	19	0	72	0	14	74	0	3	13	9	14	0	1	0	0

Table 6. Volume of runoff collected (in liters) for each rain event and each panel.

Event #	Total Precipitation (mm)	Steep-Slope Panels								Low-Slope Panels							
		AAR	ASA	CPR	CTI	PAZ	TWO	WOS	GST	BUA	BUR	BUS	EPD	PVC	TPO	ZIN	GLO
1	16.51	54.6	55.0	52.6	52.6	58.6	57.6	54.6	58.6	58.6	58.6	51.6	61.6	65.5	53.6	54.1	58.6
2	7.61	26.8	26.8	25.8	23.8	26.3	24.8	25.8	24.8	22.8	22.8	20.9	25.8	24.8	23.8	24.8	24.8
3	13.46	39.7	39.7	38.7	37.7	38.7	40.7	39.7	38.7	38.7	37.7	33.3	41.7	42.7	41.2	38.7	42.7
4	4.57	11.9	12.9	13.4	7.0	12.9	10.9	10.9	13.4	12.9	12.9	9.9	13.9	12.9	12.9	13.9	13.4
5	4.31	15.4	16.7	16.4	15.9	15.9	14.9	14.9	16.9	17.4	15.9	12.4	17.4	18.4	17.9	17.9	18.9
6	5.08	15.9	17.0	15.9	15.9	16.9	15.9	17.4	16.4	14.9	13.9	10.9	16.9	16.9	17.9	17.4	17.9
7	18.03	44.7	45.5	42.7	42.7	45.7	44.7	41.7	42.2	42.2	39.7	33.8	45.7	48.7	45.2	48.7	47.7
8	18.8	56.6	57.4	55.6	54.6	57.1	57.6	56.6	54.6	47.7	47.7	43.7	57.6	58.6	58.1	59.6	58.4
9	10.16	28.8	29.5	28.8	27.8	29.8	29.3	27.8	27.3	26.3	25.8	25.3	27.8	28.8	27.8	29.3	27.8
10	7.61	22.8	23.0	22.8	22.8	22.8	21.8	21.8	22.8	20.9	19.9	18.9	22.8	24.8	22.8	24.3	25.8

Table 7. Total arsenic concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels														Low-Slope Panels																	
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	0.40		0.21	J, a	0.05	J, a	0.36		0.14		1,520		0.23		0.16		0.10	a	0.09	J	0.14		0.02	U	35.9		0.08	J	0.81		0.09	J
2	7.6	0.801	0.27		0.10	J	0.05	J	0.33		0.05	J, a	1,510		0.57		0.05	J, a	0.07	J	0.11		0.22		0.07	J, a	40.7		0.06	J	0.02	U	0.10	
3	13.5	0.868	0.40	a	0.10	J	0.02	U	0.34		0.12		1,260	J, a	0.36		0.16		0.02	U	0.07	J	0.09	J	0.02	U	19.5		0.06	J, a	0.02	U	0.12	
4	4.6	0.283	0.41		0.17	J	0.02	U	0.65		0.02	U	3,270	J	0.29	J	0.18	J, a	0.06	J	0.26		0.40		0.02	U, a	85.5		0.25	J	0.20		0.08	J, a
5	4.3	0.467	2.96		0.35	J	0.21	J	0.90		0.28	J	3,400		0.50	J	0.26	J, a	0.18	J	0.38	J	0.49	J	0.24	J	117		0.21	J, a	0.55	J	0.34	J
6	5.1	0.303	0.41	J	0.17	J	1.40		1.19		0.07	J	4,690		1.00		0.70		0.21	J	0.19	J	0.33	J	0.10	J, a	90.1		0.19	J	0.25	J	0.335	J, a
7	18.0	1.361	0.13		0.07	J	0.04	J	0.23		0.04	J	1,080		0.10	J, a	0.06	J	0.04	J	0.07	J	0.11		0.02	U	21.5		0.04	J	0.07	J	0.06	J
8	18.8	1.106	0.41		0.05	J, a*	0.02	U	0.22	J	0.08	J	1,700		0.06	J	0.02	U	0.02	U	0.07	J	0.04	J, a	0.02	U	24.3		0.02	U	0.02	U	0.02	U
9	10.2	3.695	0.19	J, a	0.10	J	0.08	J, a	0.22	J, a	0.09	J	692	J	0.16	J	0.07	J	0.04	J	0.02	U	0.06	J	0.02	U	30.0		0.07	J	0.10	J	0.09	J
10	7.60	0.429	0.20		0.07	J, a	0.08	J	0.45		0.12	J, a	2,405	J, a	0.10	J	0.02	U	0.15	J	0.17	J	0.25		0.08	J	54.1	J, a	0.10	J	0.11	J	0.10	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

*: Where a value is less than the MDL, averages were calculated using 1/2 of the MDL.

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 8. Total cadmium concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels														Low-Slope Panels																					
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO					
1	16.5	0.710	0.005	U	0.005	U, a	0.008	J, a*	0.005	U	0.01	J	0.13		0.005	U	0.005	U	0.005	U, a	0.005	U	0.02	J	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U		
2	7.6	0.801	0.005	U	0.005	U	0.005	U	0.005	U	0.005	J, a*	0.16		0.005	U	0.005	U, a	0.005	U	0.005	U	0.01	J	0.038	J, a*	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U		
3	13.5	0.868	0.02	J, a*	0.005	U	0.03	J	0.005	U	0.005	U	0.095	J, a	0.005	U	0.005	U	0.005	U	0.005	U	0.09	J	0.005	U	0.005	U	0.005	U, a	0.01	J	0.005	U				
4	4.6	0.283	0.02	J, a	0.01	J, *	0.01	J	0.005	U	0.01	J	0.31		0.02	J	0.01	J, a	0.005	U	0.005	U	0.01	J	0.015	J, a	0.02	J	0.005	U	0.02	J	0.01	J, a				
5	4.3	0.467	0.01	J	0.005	U	0.06	J	0.010	J	0.02	J	0.31		0.02	J	0.02	J, a	0.005	U	0.005	U	0.005	U	0.01	J	0.01	J	0.005	U, a	0.02	J	0.03	J				
6	5.1	0.303	0.005	U	0.005	U	0.02	J	0.005	U	0.005	U	0.26		0.02	J	0.005	U	0.02	J	0.005	U	0.005	U	0.03	J, a	0.01	J	0.01	J	0.005	U	0.01	J, a				
7	18.0	1.361	0.005	U	0.016	J, a*	0.02	J	0.005	U	0.005	U	0.09	J	0.005	U, a	0.005	U	0.005	U	0.013	J, a*	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
8	18.8	1.106	0.005	U	0.009	J, a*	0.02	J	0.005	U	0.005	U	0.12		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U		
9	10.2	3.695	0.01	J, a	0.02	J	0.02	J, a	0.025	J, a	0.02	J	0.07	J	0.005	U	0.01	J	0.005	U	0.005	U	0.005	U	0.005	U	0.02	J	0.02	J	0.02	J	0.02	J	0.02	J		
10	7.60	0.429	0.005	U	0.012	J, *	0.02	J	0.02	J	0.02	J, a	0.14	a	0.005	U	0.005	U	0.005	U	0.01	J	0.01	J	0.005	U	0.005	U, a	0.005	U	0.02	J	0.005	U				

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

* Where a value is less than the MDL, averages were calculated using 1/2 of the MDL.

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 9. Total copper concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels														Low-Slope Panels																	
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	11.6		1.65	a	1,035	J,a	0.50	J	0.32	J	1,480	J	0.49	J	0.18	J	0.35	J,a	0.07	J	0.34	J	0.16	J	0.17	J	0.40	J	0.37	J	0.23	J
2	7.6	0.801	14.0		2.09		1,200	J	0.46	J	0.37	J	1,840		1.45		0.28	J,a	0.23	J	0.18	J	0.32	J	0.71	J,a	0.36	J	0.25	J	0.32	J	0.25	J
3	13.5	0.868	8.44	a	0.94	J	1,410	J	0.35	J	0.36	J	918	J,a	0.61	J	0.40	J	0.26	J	0.27	J	0.33	J	0.32	J	0.39	J	0.41	J,a	0.50	J	0.38	J
4	4.6	0.283	79.3		11.3		2,390	J	0.56		0.80		3,190	J	1.17		0.85	a	1.64		0.84		1.12		0.57	a	0.49		0.56		0.72		0.80	J,a
5	4.3	0.467	88.3		7.17		3,310		0.93		1.12		2,610		0.85		1.16	a	0.83		0.82		1.29		0.61		0.62	a	0.54	a	1.02		0.95	
6	5.1	0.303	30.3		2.19		3,380		0.66		0.33		1,760		0.65		0.27		0.33		0.26		0.32		0.35	a	0.47		0.33		0.39		0.41	a
7	18.0	1.361	33.6		4.37	a	1,610	J	0.36	J	0.31	J	732		0.47	J	0.22	J	0.49	J	0.31	J,a	0.39	J	0.27	J	0.28	J	0.28	J	0.25	J	0.27	J
8	18.8	1.106	25.8		2.92	a	1,160	J	0.4	J	0.58		936		2.42		0.30	J	0.36	J	0.24	J	0.36	J,a	0.34	J	0.39	J	0.33	J	0.23	J	0.33	J
9	10.2	3.695	45.9	a	4.99		1,805	J,a	1.10	a	1.31		601		0.82		0.63		0.74		0.74		1.02		0.54	J	1.15		0.76		1.03		0.57	J
10	7.60	0.429	85.8		6.99		2,270	J	1.13		0.91	a	1,045	J,a	0.73	J	0.43	J	1.13		1.07		1.38		0.94		0.71	J,a	0.60	J	0.67	J	0.42	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Bold: Analyte detected above the MDL.

Table 10. Total lead concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels														Low-Slope Panels																	
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	0.04	J	1.15	a	0.67	a	1.65		0.18		0.002	U	0.03	J	0.18		0.03	J,a	0.04	J	0.05	J	0.07	J	0.18		0.16		0.41		0.22	
2	7.6	0.801	0.01	J	0.03	J	0.56		0.55		0.07	a,*	0.03	J	0.02	J	0.10	J,a	0.002	U	0.002	U	0.04	J	0.12	a	0.09	J	0.04	J	0.15		0.08	J
3	13.5	0.868	0.01	J	0.04	J	0.19		0.20		0.13	J	0.08	J,a	0.04	J	0.12	J,a	0.03	J	0.03	J	0.07	J	0.54		0.14	J	0.11	J,a	0.18		0.68	
4	4.6	0.283	0.06	J	0.07	J	0.30		0.33		0.30		0.26		0.06		0.27	a	0.04	J	0.04	J	0.04	J	0.16	a	0.19		0.08	J	0.18		0.24	a
5	4.3	0.467	0.05	J	0.05	J	0.49		0.31		0.46		0.05	J	0.12		0.44	a	0.04	J	0.03	J	0.03	J	0.20		0.37	a	0.05	J,a*	0.37		0.47	
6	5.1	0.303	0.05	J	0.06	J	0.20		0.25		0.30		0.03	J	0.08	J	0.28		0.04	J	0.03	J	0.04	J	0.11	J,a	0.33		0.13		0.30		0.36	a
7	18.0	1.361	0.05	J	0.06	J	0.25		0.17		0.17		0.03	J	0.04	J,a	0.14		0.05	J	0.04	J,a	0.04	J	0.09	J	0.16		0.15		0.18		0.16	
8	18.8	1.106	0.03	J	0.07	J,a	0.21		0.13		0.07	J	0.04	J	0.05	J	0.07	J	0.03	J	0.02	J	0.02	J,a	0.15		0.12		0.16		0.11		0.11	
9	10.2	3.695	0.06	J,a	0.07	J	0.23	a	0.21	a	0.17		0.05	J	0.04	J	0.11		0.07	J	0.03	J	0.03	J	0.17		0.22		0.12		0.16		0.15	
10	7.60	0.429	0.05	J	0.06	J	0.33		0.48		0.18	a	0.04	J,a	0.04	J	0.13		0.11		0.07	J	0.07	J	0.25		0.19	a	0.16		0.18		0.13	

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

* Where a value is less than the MDL, averages were calculated using 1/2 of the MDL.

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 11. Total zinc concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels															Low-Slope Panels																
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	8.7		1.9	J,a	5.8	a	4.4	J	18		11		5.7		3.5	J	1.1	J,a	1.6	J	1.9	J	99		4.7	J	3.7	J	121		2.2	J
2	7.6	0.801	10	J	3.7	J	2.8	J	2.9	J	21	a	13	J	6.2	J	5.1	J,a	1.3	J	1.3	J	4.2	J	130	a	5.1	J	2.6	J	117		3.4	J
3	13.5	0.868	7.4	J,a	1.7	J	2.1	J	3.6	J	23		8.1	J	3.8	J	1.9	J	3.0	J	3.4	J	1.8	J	49		3.7	J	2.9	J,a	69		1.6	J
4	4.6	0.283	18	J	5.0	J	5.6	J	6.2	J	58		20		9.7	J	3.2	J,a	2.4	J	2.2	J	4.5	J	313	a	11	J	3.1	J	192		6.1	J,a
5	4.3	0.467	19	J	5.1	J	6.4	J	8.1	J	73		26		10	J	6.4	J,a	3.7	J	4.0	J	3.4	J	276		10.9	J,a	3.4	J,a	322		7.5	J
6	5.1	0.303	14	J	6.4	J	3.4	J	3.2	J	83		16	J	17	J	3.0	J	9.0	J	2.5	J	4.9	J	200	a	8	J	3.2	J	578		2.3	J,a
7	18.0	1.361	14	J	3.2	J,a	6.0	J	3.9	J	24	J	7.4	J	5.2	J,a	4.4	J	2.9	J	4.3	J,a	6.1	J	65	J	5	J	3.6	J	45	J	3.6	J
8	18.8	1.106	6.4	J	3.7	J,a	3.9	J	3.2	J	18		8.0	J	4.7	J	3.4	J	2.1	J	4.9	J	2.7	J,a	44		5	J	6.0	J	38		4.2	J
9	10.2	3.695	11	J,a	6.9		6.1	J,a	9.5	J,a	30		7.8		5.0	J	4.3	J	3.0	J	2.8	J	2.4	J	99		12	J	7.6		131		5.9	
10	7.60	0.429	12		5.1	J	12		11		48	a	10	J,a	6.4	J	5.8	J	5.1	J	6.3	J	4.2	J	108		11	a	7.5	J	103		5.1	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Bold: Analyte detected above the MDL.

Table 12. Dissolved arsenic concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels															Low-Slope Panels																
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	0.53	J	0.205	J,a	0.07	a	0.33	J	0.12	J	1600	J	0.23	J	0.13	J	0.0825	J,a	0.1	J	0.15	J	0.07	J	34.8	J	0.05	J	0.17	J	0.09	J
2	7.6	0.801	0.3	J	0.143	J	0.23	J	0.38	J	0.105	J,a	1510	J	0.3	J	0.105	J,a	0.09	J	0.1	J	0.14	J	0.055	J,a	39.9	J	0.06	J	0.03	J	0.1	J
3	13.5	0.868	0.325	J,a	0.057	J	0.05	J	0.29	J	0.03	J	1510	J	0.3	J	0.06	J	0.04	J	0.06	J	0.09	J	0.04	J	19.1	J	0.045	J,a	0.07	J	0.04	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Bold: Analyte detected above the MDL.

Table 13. Dissolved cadmium concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels												Low-Slope Panels																			
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	0.004	J	0.006	J,a	0.012	J,a	0.004	J	0.010	J	0.131	J	0.008	J	0.009	J	0.001	U,a	0.010	J	0.001	U	0.007	J	0.006	J	0.006	J	0.005	J	0.007	J
2	7.6	0.801	0.003	J	0.004	J	0.018	J	0.005	J	0.007	J,a	0.160	J	0.007	J	0.004	J	0.001	U	0.004	J	0.001	U	0.007	J	0.005	J	0.005	J	0.006	J	0.004	J
3	13.5	0.868	0.012	J,a*	0.011	J	0.011	J	0.004	J	0.007	J	0.087	J,a	0.007	J	0.007	J	0.003	J	0.001	U	0.001	U	0.007	J	0.006	J	0.007	J,a	0.006	J	0.006	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

* Where a value is less than the MDL, averages were calculated using 1/2 of the MDL.

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 14. Dissolved copper concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels												Low-Slope Panels																			
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	7.58	J	1.09	J,a	1,040	J,a	0.20	J	0.23	J	1,470	J	1.24	J	0.17	J	0.16	J,a	0.17	J	0.20	J	0.09	J	0.14	J	0.15	J	0.19	J	0.15	J
2	7.6	0.801	11.8	J	1.78	J	1150	J	0.25	J	0.25	J,a	1700	J	0.99	J	0.19	J	2.42	J	0.17	J	0.21	J	0.13	J	0.17	J	0.18	J	0.22	J	0.14	J
3	13.5	0.868	6.14	J,a	0.74	J	1,400	J	0.12	J	0.27	J	879	J,a	0.94	J	0.33	J	0.35	J	0.15	J	0.12	J	0.25	J	0.25	J	0.30	J,a	0.35	J	0.32	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Bold: Analyte detected above the MDL.

Table 15. Dissolved lead concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels												Low-Slope Panels																			
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	0.012	J	0.33	J,a	0.288	J,a	0.08	J	0.144	J	0.057	J	0.039	J	0.121	J	0.02	J,a	0.012	J	0.009	J	0.043	J	0.101	J	0.046	J	0.206	J	0.121	J
2	7.6	0.801	0.007	J	0.02	J	26.5	J	0.046	J	0.06	J,a	0.023	J	0.03	J	0.058	J,a	0.009	J	0.008	J	0.007	J	0.03	J,a	0.043	J	0.023	J	0.102	J	0.051	J
3	13.5	0.868	0.03	J,a	0.01	J	0.163	J	0.06	J	0.099	J	0.057	J,a		J	0.096	J	0.069	J	0.013	J	0.012	J	0.102	J	0.105	J	0.06	J,a	0.115	J	0.19	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Bold: Analyte detected above the MDL.

Table 16. Dissolved zinc concentration (ug/L) by panel and rain event.

Event #	Total Precip. (mm)	Average Rain Intensity (mm/hr)	Steep-Slope Panels												Low-Slope Panels																			
			AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1	16.5	0.710	9.6	J	3.03	J,a	5.9	a	4.1	J	18.2	J	14	J	5.7	J	5.0	J	3.8	J,a	4.8	J	1.7	J	105	J	7.9	J	7.6	J	13	J	2.3	J
2	7.6	0.801	12.1	J	11.5	J	10.1	J	4.3	J	22.1	J,a	13	J	5.1	J	6.3	J,a	3.6	J	2.4	J	2.2	J	132	J,a	4.7	J	2.7	J	119	J	2.9	J
3	13.5	0.868	8.7	J,a	3.77	J	4.40	J	2.7	J	25.3	J	8.5	J,a	4.5	J	5.7	J	6.3	J	6.0	J	1.4	J	55	J	7.2	J	4.0	J,a	71	J	5.6	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Bold: Analyte detected above the MDL.

Table 17. Concentrations of PAHs (in ug/L) in runoff from rain event 1.

PAHs	Steep-Slope Panels												Low-Slope Panels																					
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO			
1-Methylnaphthalene	0.001	U	0.001	J,a*	0.001	U,a	0.001	U	0.001	U	0.016	J	0.005	U	0.002	J	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
2-Methylnaphthalene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.130	J	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.007	U		Rej	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthylene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U		Rej		Rej	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Anthracene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.007	J
Benz[a]anthracene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(a)pyrene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.008	J	0.001	U	0.001	U
Benzo(b)fluoranthene	0.001	U	0.002	J,a*	0.003	J,a*	0.009	J	0.006	J	0.001	U	0.001	U	0.001	U	0.002	J,a*	0.001	U	0.001	U	0.009	J	0.001	U	0.011		0.001	U	0.008	J		
Benzo(ghi)perylene	0.001	U	0.001	J,a*	0.001	U,a	0.005	J	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.007	J	0.001	U	0.007	J	0.005	J	0.001	U		
Benzo(k)fluoranthene	0.001	U	0.002	J,a*	0.001	U,a	0.009	J	0.006	J	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.006	J	0.001	U	0.007	J	0.001	U	0.008	J		
Chrysene	0.001	U	0.001	U,a	0.001	U,a	0.003	J	0.001	J	0.001	U	0.001	U	0.001	U	0.002	J,a*	0.001	U	0.001	U	0.001	U	0.001	U	0.003	J	0.001	U	0.001	U		
Dibenzo(a,h)anthracene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Fluoranthene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.003	J,a*	0.001	U	0.005	J	0.011		0.005	J	0.007	J	0.006	J	0.001	U		
Fluorene	0.001	U	0.000	U,a	0.000	U,a	0.000	U	0.002	J	0.000	U	0.000	U	0.001	U	0.000	U,a	0.003	J	0.003	J	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.000	U
Indeno(1,2,3-cd)pyrene	0.001	U	0.002	J,a*	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.006	J	0.001	U	0.007	J	0.006	J	0.001	U		
Naphthalene	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.006	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Phenanthrene	0.012		0.011	J,a	0.003	J,a*	0.007	J	0.007	J	0.001	U	0.001	U	0.009	J	0.004	J,a*	0.007	J	0.016		0.010	J	0.001	U	0.005	J	0.005	J	0.001	U		
Pyrene	0.001	U	0.003	J,a*	0.003	J,a*	0.006	J	0.006	J	0.001	U	0.001	U	0.006	J	0.002	J,a*	0.001	U	0.004	J	0.026		0.005	J	0.006	J	0.005	J	0.006	J		

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

L: Sample lost

Rej: Data rejected

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 18. Concentrations of PAHs (in ug/L) in runoff from rain event 2.

PAHs	Steep-Slope Panels														Low-Slope Panels																			
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO			
1-Methylnaphthalene	0.001	U	0.003	J,*	0.001	U	0.001	U	0.001	U,a	0.027	J	0.001	U	0.001	U,a	0.001	U	0.002	J	0.007	J	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U		
2-Methylnaphthalene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.012	J	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U		Rej	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthylene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U		Rej	0.001	U,a	0.001	U	0.001	U	0.002	U	0.001	U,a	0.002	U	0.001	U	0.001	U	0.001	U	0.001	U
Anthracene	0.001	U	0.009	J,*	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.004	J,a*	0.001	U	0.001	U	0.002	U	0.001	U,a	0.002	U	0.001	U	0.001	U	0.001	U	0.001	U
Benz[a]anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(a)pyrene	0.001	U	0.001	U	0.009	J	0.007	J	0.001	U,a	0.001	U	0.009	U	0.005	J,a*	0.001	U	0.001	U	0.002	U	0.001	U,a	0.002	U	0.001	U	0.001	U	0.001	U	0.010	J
Benzo(b)fluoranthene	0.001	U	0.003	J,*	0.012		0.009	J	0.013	a	0.001	U	0.006	U	0.014		0.001	U	0.001	U	0.001	U	0.014		0.013	J	0.009	J	0.012		0.015			
Benzo(ghi)perylene	0.001	U	0.002	J,*	0.007	J	0.001	U	0.007	J,a	0.001	U	0.009	U	0.008	J,a	0.001	U	0.001	U	0.002	U	0.009	J,a	0.005	J	0.001	U	0.006	J	0.009	J		
Benzo(k)fluoranthene	0.001	U	0.003	J,*	0.008	J	0.007	J	0.007	J,a	0.001	U	0.006	U	0.011		0.001	U	0.001	U	0.001	U	0.008	J,a	0.001	U	0.001	U	0.007	J	0.009	J		
Chrysene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Dibenzo(a,h)anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.008	U	0.001	U,a	0.001	U	0.001	U	0.002	U	0.001	U,a	0.002	U	0.001	U	0.001	U	0.001	U	0.001	U
Fluoranthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.012		0.001	U	0.001	U	0.005	J	0.001	U		
Fluorene	0.001	U	0.004	J,*	0.001	U	0.001	U	0.000	U,a	0.000	U	0.001	U	0.000	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.000	U
Indeno(1,2,3-cd)pyrene	0.001	U	0.001	U	0.009	J	0.001	U	0.009	J,a	0.001	U	0.011	J	0.010		0.001	U	0.001	U	0.002	U	0.009	J,a	0.008	J	0.007	J	0.008	J	0.011			
Naphthalene	0.001	U	0.004	J,*	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.003	J,a*	0.001	U	0.006	J	0.011	J	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Phenanthrene	0.010	J	0.010	J	0.001	U	0.005	J	0.003	J,a*	0.001	U	0.001	U	0.005	J,a	0.005	J	0.009	J	0.018	J	0.007	J,a*	0.002	U	0.001	U	0.005	J	0.005	J		
Pyrene	0.001	U	0.001	U	0.006	J	0.005	J	0.006	J,a	0.001	U	0.001	U	0.006	J,a	0.001	U	0.001	U	0.010	J	0.029		0.010	J	0.001	U	0.005	J	0.006	J		

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Rej: Data rejected

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL

Table 19. Concentrations of PAHs (in ug/L) in runoff from rain event 3.

PAHs	Steep-Slope Panels														Low-Slope Panels																	
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
1-Methylnaphthalene	0.001	U,a	0.004	J,*	0.001	U	0.001	U	0.001	U	0.046	J,a*	0.005	U	0.001	U	0.001	U	0.001	U	0.019	J	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
2-Methylnaphthalene	0.008	J,a	0.006	J,*	0.007	J	0.008	J	0.001	U	0.001	U,a	0.006	U	0.001	U	0.001	U	0.007	J	0.032		0.001	U	0.001	U	0.001	U,a	0.006	J	0.006	J
Acenaphthene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.002	U,a		Rej	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Acenaphthylene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.003	U,a		Rej	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Anthracene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.014		0.001	U,a	0.048		0.001	U	0.011		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Benz[a]anthracene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.005	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Benzo(a)pyrene	0.001	U,a	0.003	J,*	0.008	J	0.001	U	0.001	U	0.001	U,a	0.009	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Benzo(b)fluoranthene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.006	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Benzo(ghi)perylene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.009	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Benzo(k)fluoranthene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.006	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Chrysene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.007	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Dibenzo(a,h)anthracene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.008	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Fluoranthene	0.001	U,a	0.001	U	0.007	J	0.001	U	0.006	J	0.005	J,a	0.001	U	0.007	J	0.001	U	0.001	U	0.001	U	0.010		0.001	U	0.001	U,a	0.001	U	0.007	J
Fluorene	0.006	J,a	0.005	J,*	0.001	U	0.001	U	0.001	U	0.000	U,a	0.000	U	0.000	U	0.000	U	0.005	J	0.006	J	0.001	U	0.000	U	0.000	U,a	0.000	U	0.000	U
Indeno(1,2,3-cd)pyrene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.010	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
Naphthalene	0.015		0.012	J,*	0.017		0.017		0.018		0.008	J,a*	0.006	U	0.015		0.017		0.014		0.034		0.016		0.001	U	0.017		0.016		0.017	
Phenanthrene	0.010	J,a	0.011	J	0.011		0.008	J	0.010		0.001	U,a	0.001	U	0.010		0.008	J	0.011		0.025		0.012		0.001	U	0.006	J,a	0.007	J	0.011	
Pyrene	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.010	U	0.001	U	0.001	U	0.001	U	0.001	U	0.031		0.001	U	0.001	U,a	0.001	U	0.001	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Rej: Data rejected

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL

Table 20. Concentrations of PAHs (in ug/L) in runoff from rain event 4.

PAHs	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
1-Methylnaphthalene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.014	J	0.003	J,a*	0.017	J	0.001	U	0.001	U,a
2-Methylnaphthalene	0.001	U	0.001	U	0.003	J,a*	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.005	J,a*
Acenaphthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Acenaphthylene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Anthracene	0.001	U	0.001	U	0.009	J,a*	0.001	U	0.001	U	0.056		0.029	U,a	0.007	J	0.001	U	0.009	J,a*
Benz[a]anthracene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Benzo(a)pyrene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.004	J,a*
Benzo(b)fluoranthene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Benzo(ghi)perylene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001		0.001	U	0.001	U	0.001	U,a
Benzo(k)fluoranthene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Chrysene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Dibenzo(a,h)anthracene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Fluoranthene	0.001	U	0.001	U	0.012		0.001	U	0.001	U	0.001	U	0.016	a	0.001	U	0.001	U	0.011	
Fluorene	0.000	U	0.001	U	0.004	J,a*	0.000	U	0.000	U	0.000	U	0.000	U,a	0.001	U	0.000	U	0.000	U
Indeno(1,2,3-cd)pyrene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U
Naphthalene	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.021		0.011	U,a	0.001	U	0.001	U	0.001	U
Phenanthrene	0.018		0.015		0.012	J,a	0.010	J	0.001	U	0.041	J	0.021	U,a	0.006	J	0.007	J	0.013	J,a
Pyrene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001		0.001	U	0.001	U	0.001	U,a

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 21. Concentrations of PAHs (in ug/L) in runoff from rain event 5.

PAHs	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
1-Methylnaphthalene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.019		0.001	U	0.001	U,a	0.001	U,a	0.001	U
2-Methylnaphthalene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.031		0.001	U	0.001	U,a	0.001	U,a	0.001	U
Acenaphthene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U
Acenaphthylene	0.002	U	0.002	U	0.001	U,a	L		0.002	U	0.001	U	0.002	U	0.001	U,a	0.001	U,a	0.001	U
Anthracene	0.002	U	0.002	U	0.002	U,a	L		0.002	U	0.001	U	0.002	U	0.001	U,a	0.005	J,a*	0.001	U
Benz[a]anthracene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U
Benzo(a)pyrene	0.002	U	0.002	U	0.014	J,a	L		0.002	U	0.001	U	0.002	U	0.001	U,a	0.001	U,a	0.010	J
Benzo(b)fluoranthene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U
Benzo(ghi)perylene	0.002	U	0.002	U	0.010	J,a*	L		0.002	U	0.001	U	0.020		0.001	U,a	0.001	U,a	0.001	U
Benzo(k)fluoranthene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U
Chrysene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U
Dibenzo(a,h)anthracene	0.002	U	0.001	U	0.001	U,a	L		0.002	U	0.001	U	0.002	U	0.001	U,a	0.001	U,a	0.001	U
Fluoranthene	0.001	U	0.001	U	0.019		L		0.001	U	0.001	U	0.027		0.001	U,a	0.001	U,a	0.014	J
Fluorene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U
Indeno(1,2,3-cd)pyrene	0.002	U	0.002	U	0.010	J,a*	L		0.002	U	0.001	U	0.002	U	0.001	U,a	0.002	U,a	0.001	U
Naphthalene	0.001	U	0.001	U	0.001	U,a	L		0.001	U	0.026		0.001	U	0.001	U,a	0.006	J,a*	0.012	J
Phenanthrene	0.020		0.020	J	0.014	J,a	L		0.019	J	0.050		0.002	U	0.001	U,a	0.002	U,a	0.001	U
Pyrene	0.002	U	0.002	U	0.002	U,a	L		0.002	U	0.001	U	0.056		0.001	U,a	0.002	U,a	0.001	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

L: Sample lost

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 22. Concentrations of PAHs (in ug/L) in runoff from rain event 6.

PAHs	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
1-Methylnaphthalene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.016		0.001	U,a	0.001	U	0.001	U	0.001	U,a
2-Methylnaphthalene	0.001	U	0.003	J,*	0.001	U	0.001	U	0.001	U	0.026		0.001	U,a	0.001	U	0.001	U	0.001	U,a
Acenaphthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Acenaphthylene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Benz[a]anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Benzo(a)pyrene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Benzo(b)fluoranthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Benzo(ghi)perylene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.007	J,a	0.001	U	0.001	U	0.001	U,a
Benzo(k)fluoranthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Chrysene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Dibenzo(a,h)anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Fluoranthene	0.001	U	0.001	U	0.006	J	0.001	U	0.001	U	0.001	U	0.017	J,a	0.001	U	0.001	U	0.006	J,a
Fluorene	0.001	U	0.008	J,*	0.001	U	0.001	U	0.001	U	0.008	J	0.000	U,a	0.000	U	0.000	U	0.001	U,a
Indeno(1,2,3-cd)pyrene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Naphthalene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
Phenanthrene	0.014	J	0.013	J	0.008	J	0.009	J	0.014	J	0.033	J	0.011	J,a*	0.005	J	0.008	J	0.008	J,a
Pyrene	0.007	J	0.001	U	0.008	J	0.001	U	0.001	U	0.001	U	0.050	J,a	0.001	U	0.001	U	0.008	J,a

^A Average of three replicate asphalt shingle panels

^A Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 23. Concentrations of PAHs (in ug/L) in runoff from rain event 7.

PAHs	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
1-Methylnaphthalene		Rej	0.001	U,a		Rej	0.001	U	0.001	U,a	0.012	J	0.001	U	0.001	U	0.001	U		Rej
2-Methylnaphthalene	0.001	U	0.001	U,a		Rej	0.001	U	0.001	U,a	0.023	J	0.001	U	0.001	U	0.001	U		Rej
Acenaphthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthylene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Anthracene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benz[a]anthracene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(a)pyrene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(b)fluoranthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(ghi)perylene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(k)fluoranthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Chrysene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Dibenzo(a,h)anthracene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Fluoranthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.014	J	0.001	U	0.001	U	0.001	U
Fluorene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.000	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Indeno(1,2,3-cd)pyrene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Naphthalene	0.001	U	0.006	J,a*	0.001	U	0.001	U	0.001	U,a	0.022	J	0.001	U	0.001	U	0.001	U	0.001	U
Phenanthrene	0.013	J	0.014	J,a	0.010	J	0.001	U	0.013	J,a	0.036	J	0.001	U	0.001	U	0.001	U	0.011	J
Pyrene	0.001	U	0.001	U,a	0.008	J	0.001	U	0.001	U,a	0.001	U	0.027	J	0.001	U	0.001	U	0.009	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

Rej: Data rejected

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 24. Concentrations of PAHs (in ug/L) in runoff from rain event 8.

PAHs	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
1-Methylnaphthalene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.009	J,a	0.001	U	0.001	U	0.001	U	0.001	U
2-Methylnaphthalene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.016		0.031	J	0.001	U	0.001	U	0.001	U
Acenaphthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthylene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Anthracene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Benzo[a]anthracene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(a)pyrene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(b)fluoranthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(ghi)perylene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(k)fluoranthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Chrysene	0.001	U	0.002	J,a*	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Dibenzo(a,h)anthracene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Fluoranthene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Fluorene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.003	J,a*	0.001	U	0.001	U	0.001	U	0.001	U
Indeno(1,2,3-cd)pyrene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
Naphthalene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.007	J,a*	0.001	U	0.001	U	0.001	U	0.001	U
Phenanthrene	0.011		0.008	J,a*	0.001	U	0.001	U	0.011		0.027		0.001	U	0.001	U	0.001	U	0.001	U
Pyrene	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U,a	0.038		0.001	U	0.001	U	0.001	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 25. Concentrations of PAHs (in ug/L) in runoff from rain event 9.

PAHs	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
1-Methylnaphthalene	0.001	U,a	0.001	U,a	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
2-Methylnaphthalene	0.001	U,a	0.001	U,a	0.001	U	0.001	U,a	0.001	U	0.011		0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthene	0.001	U,a	0.001	U,a	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthylene	0.001	U,a	0.001	U,a	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Anthracene	0.001	U,a	0.001	U,a	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benz[a]anthracene	0.010	U,a	0.010	U,a	0.010	U	0.010	U,a	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U
Benzo(a)pyrene	0.010	U,a	0.010	U,a	0.010	J	0.010	U,a	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U	0.010	J
Benzo(b)fluoranthene	0.010	U,a	0.010	U,a	0.015	J	0.010	U,a	0.010	U	0.010	U	0.012	J	0.014	J	0.008	J	0.016	J
Benzo(ghi)perylene	0.010	U,a	0.010	U,a	0.012		0.010	U,a	0.010	U	0.010	U	0.011		0.010	U	0.010	U	0.012	
Benzo(k)fluoranthene	0.001	U,a	0.001	U,a	0.012		0.001	U,a	0.001	U	0.001	U	0.011		0.014	J	0.001	U	0.012	
Chrysene	0.005	J,a*	0.011	J,a	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Dibenzo(a,h)anthracene	0.001	U,a	0.001	U,a	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Fluoranthene	0.001	U,a	0.001	U,a	0.010	J	0.001	U,a	0.001	U	0.001	U	0.016		0.011		0.001	U	0.010	J
Fluorene	0.010	U,a	0.010	U,a	0.010	U	0.010	U,a	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U
Indeno(1,2,3-cd)pyrene	0.001	U,a	0.001	U,a	0.009	J	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.009	J
Naphthalene	0.010	U,a	0.010	U,a	0.010	U	0.010	U,a	0.010	U	0.011	U	0.010	U	0.010	U	0.010	U	0.010	U
Phenanthrene	0.010	U,a	0.011	J,a,*	0.010	U	0.010	U,a	0.011		0.021		0.010	U	0.010	U	0.010	U	0.010	U
Pyrene	0.001	U,a	0.001	U,a	0.001	U	0.001	U,a	0.001	U	0.001	U	0.033		0.001	U	0.001	U	0.001	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 26. Concentrations of PAHs (in ug/L) in runoff from rain event 10.

PAHs	Steep-Slope Panels						Low-Slope Panels																					
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO									
1-Methylnaphthalene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
2-Methylnaphthalene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Acenaphthylene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benz[a]anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(a)pyrene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(b)fluoranthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(ghi)perylene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Benzo(k)fluoranthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Chrysene	0.010	J	0.010	J	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Dibenzo(a,h)anthracene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Fluoranthene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Fluorene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Indeno(1,2,3-cd)pyrene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Naphthalene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Phenanthrene	0.014		0.013		0.001	U	0.008	J	0.013	a	0.029		0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Pyrene	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a	0.001	U	0.051		0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 27. Concentrations of phthalates (in ug/L) in runoff from rain event 1.

Phthalates	Steep-Slope Panels														Low-Slope Panels																	
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U	0.25	J,a*	0.33	J,a	0.050	U,a	0.050	U	2.6	J	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Butyl benzyl phthalate	0.009	U	0.070	J,a*	0.009	U,a	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Diethyl phthalate	0.009	U	0.009	U,a	0.009	U,a	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Dimethyl phthalate	0.007	U	0.007	U,a	0.007	U,a	0.007	U,a	0.007	U	2.0	J	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.20	J		
Di-N-butyl phthalate	0.005	U	0.005	U,a	0.005	U,a	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Di-N-octyl phthalate	0.005	U	0.39	J,a*	0.24	J,a	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.44	J	0.005	U	0.005	U	0.005	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Where a value is less than the MDL, averages were calculated using 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 28. Concentrations of phthalates (in ug/L) in runoff from rain event 2.

Phthalates	Steep-Slope Panels														Low-Slope Panels																			
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO			
Bis(2-ethylhexyl) phthalate	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U,a	4.2	J	0.85	J	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U		
Butyl benzyl phthalate	0.009	U	0.12	J	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Diethyl phthalate	0.009	U	0.009	U	0.009	U	0.009	U	0.02	J,a*	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Dimethyl phthalate	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
Di-N-butyl phthalate	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Di-N-octyl phthalate	0.005	U	0.095	J	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 29. Concentrations of phthalates (in ug/L) in runoff from rain event 3.

Phthalates	Steep-Slope Panels														Low-Slope Panels																			
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO			
Bis(2-ethylhexyl) phthalate	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U	1.70	J,a	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U		
Butyl benzyl phthalate	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Diethyl phthalate	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Dimethyl phthalate	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
Di-N-butyl phthalate	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Di-N-octyl phthalate	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.12	J,a*	0.005	U	0.005	U	0.25	J	0.005	U	0.005	U	0.32	J	0.005	U	0.005	U	0.005	U	0.005	U	0.53	J

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 30. Concentrations of phthalates (in ug/L) in runoff from rain event 4.

Phthalates	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U,a
Butyl benzyl phthalate	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a
Diethyl phthalate	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.33	J,a*
Dimethyl phthalate	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.12	J,a	0.007	U	0.007	U	0.007	U,a
Di-N-butyl phthalate	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a
Di-N-octyl phthalate	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.10	J,a*

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 31. Concentrations of phthalates (in ug/L) in runoff from rain event 5.

Phthalates	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U	0.050	U	0.050	U,a	L		0.050	U	0.050	U	0.050	U	0.050	U,a	0.050	U,a	0.050	U
Butyl benzyl phthalate	0.009	U	0.009	U	0.009	U,a	L		0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U,a	0.009	U
Diethyl phthalate	0.009	U	0.009	U	0.009	U,a	L		0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U,a	0.13	J
Dimethyl phthalate	0.007	U	0.007	U	0.007	U,a	L		0.007	U	0.007	U	0.007	U	0.007	U,a	0.007	U,a	0.007	U
Di-N-butyl phthalate	0.005	U	0.005	U	0.005	U,a	L		0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U,a	0.005	U
Di-N-octyl phthalate	0.005	U	0.005	U	0.005	U,a	L		0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U,a	0.005	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

L: Sample lost

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 32. Concentrations of phthalates (in ug/L) in runoff from rain event 6.

Phthalates	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U,a
Butyl benzyl phthalate	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U,a
Diethyl phthalate	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U,a
Dimethyl phthalate	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U,a
Di-N-butyl phthalate	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a
Di-N-octyl phthalate	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 33. Concentrations of phthalates (in ug/L) in runoff from rain event 7.

Phthalates	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Butyl benzyl phthalate	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Diethyl phthalate	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Dimethyl phthalate	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
Di-N-butyl phthalate	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Di-N-octyl phthalate	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 34. Concentrations of phthalates (in ug/L) in runoff from rain event 8.

Phthalates	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U
Butyl benzyl phthalate	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U
Diethyl phthalate	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U
Dimethyl phthalate	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U
Di-N-butyl phthalate	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U
Di-N-octyl phthalate	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 35. Concentrations of phthalates (in ug/L) in runoff from rain event 9.

Phthalates	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U,a	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Butyl benzyl phthalate	0.009	U,a	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Diethyl phthalate	0.009	U,a	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U
Dimethyl phthalate	0.007	U,a	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
Di-N-butyl phthalate	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Di-N-octyl phthalate	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.20	J	0.20	J	0.005	U	0.005	U	0.005	U	0.005	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 36. Concentrations of phthalates (in ug/L) in runoff from rain event 10.

Phthalates	Steep-Slope Panels						Low-Slope Panels													
	AAR		AS ^A		GST		BUA		BUR		BUS		EPD		PVC		TPO		GLO	
Bis(2-ethylhexyl) phthalate	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U,a	0.050	U	0.050	U	0.050	U,a	0.050	U,a	0.050	U
Butyl benzyl phthalate	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U,a	0.009	U,a	0.009	U
Diethyl phthalate	0.009	U	0.009	U	0.009	U	0.009	U	0.009	U,a	0.009	U	0.009	U	0.009	U,a	0.009	U,a	0.009	U
Dimethyl phthalate	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U,a	0.007	U	0.007	U	0.007	U,a	0.007	U,a	0.007	U
Di-N-butyl phthalate	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.005	U,a	0.005	U
Di-N-octyl phthalate	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U,a	0.005	U	0.005	U	0.005	U,a	0.005	U,a	0.005	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 37. Concentrations of PBDEs (in ug/L) in runoff from rain event 1.

PBDEs	Steep-Slope Panels															Low-Slope Panels																		
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO			
PBDE-047	0.0004	U	0.0004	U,a	0.0004	U,a	0.0004	U	0.0004	U	0.001	U	0.001	U	0.0004	U	0.0004	U,a	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U		
PBDE-049	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.001	U	0.001	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-066	0.0002	U	0.0002	U,a	0.0002	U,a	0.0002	U	0.0002	U	0.00035	U	0.0004	U	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U
PBDE-071	0.00045	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.001	U	0.001	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0045	U
PBDE-099	0.0005	U	0.0005	U,a	0.0018	J,a*	0.0005	U	0.0005	U	0.001	U	0.004		0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0003	J	0.0005	U	0.0005	U		
PBDE-100	0.0005	U	0.0005	U,a	0.0005	J,a*	0.0005	U	0.0005	U	0.001	U	0.0009	J	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-138	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.002	U	0.0025	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
PBDE-153	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.001	U	0.001	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-154	0.0005	U	0.0005	U,a	0.0013	J,a*	0.0005	U	0.0005	U	0.001	U	0.001	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-183	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.0015	U	0.0015	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.002	J	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
PBDE-184	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.001	U	0.001	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-191	0.001	U	0.001	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0015	U	0.0015	U	0.001	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.001	U
PBDE-209	0.0015	U	0.0015	U,a	0.0015	U,a	0.0015	U	0.0015	U	0.003	U	0.0035	U	0.0015	U	0.0015	U,a	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.005	J	0.0015	U	0.0015	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 38. Concentrations of PBDEs (in ug/L) in runoff from rain event 2.

PBDEs	Steep-Slope Panels															Low-Slope Panels																
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
PBDE-047	0.0004	U	0.0004	U,a	0.00035	U	0.0004	U	0.0005	U,a	0.0004	U	0.0004	U	0.00035	U,a	0.00035	U	0.00035	U	0.00035	U	0.0004	U,a	0.0004	U	0.0004	U	0.00035	U	0.00035	U
PBDE-049	0.0005	U	0.0005	U,a	0.00045	U	0.0005	U	0.001	U,a	0.0005	U	0.0005	U	0.00045	U,a	0.00045	U,a	0.00045	U	0.00045	U	0.0005	U,a	0.0005	U	0.0005	U	0.00045	U	0.00045	U
PBDE-066	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U	0.0003	U,a	0.0002	U	0.0002	U	0.0002	U,a	0.0002	U,a	0.0002	U	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U	0.0002	U	0.0002	U
PBDE-071	0.00045	U	0.0005	U,a	0.00045	U	0.00045	U	0.001	U,a	0.00045	U	0.00045	U	0.00045	U,a	0.00045	U,a	0.00045	U	0.00045	U	0.00045	U,a	0.00045	U	0.00045	U	0.00045	U	0.00045	U
PBDE-099	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.001	U,a	0.0005	U	0.002	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	J	0.0005	U	0.0005	U
PBDE-100	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.001	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-138	0.001	U	0.001	U,a	0.001	U	0.001	U	0.002	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
PBDE-153	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.001	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-154	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.001	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-183	0.001	U	0.001	U,a	0.001	U	0.001	U	0.0015	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U	0.001	U
PBDE-184	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.001	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-191	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.001	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-209	0.0015	U	0.0015	U,a	0.0015	U	0.0015	U	0.002	U,a	0.0015	U	0.0015	U	0.0015	U,a	0.0015	U,a	0.0015	U	0.0015	U	0.0015	U,a	0.0015	U	0.0015	J	0.0015	U	0.0015	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 39. Concentrations of PBDEs (in ug/L) in runoff from rain event 3.

PBDEs	Steep-Slope Panels														Low-Slope Panels																	
	AAR		AS ^A		CPR		CTI		PAZ		TWO		WOS		GST		BUA		BUR		BUS		EPD		PVC		TPO		ZIN		GLO	
PBDE-047	0.0004	U,a	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U,a	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U,a	0.0004	U	0.0004	U
PBDE-049	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0010	J,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-066	0.0002	U,a	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U
PBDE-071	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-099	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0010	J	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-100	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-138	0.0010	U,a	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U,a	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U,a	0.0010	U	0.0010	U
PBDE-153	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-154	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0013	J,a*	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-183	0.0010	U,a	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U,a	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0020	J	0.0010	U	0.0010	U	0.0010	U,a	0.0010	U	0.0010	U
PBDE-184	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-191	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0020	J,a	0.0030	J	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-209	0.0015	U,a	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U,a	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U,a	0.0015	U	0.0015	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 40. Concentrations of PBDEs (in ug/L) in runoff from rain event 4.

PBDEs	Steep-Slope Panel		Low-Slope Panels							
	GST		EPD		PVC		TPO		GLO	
PBDE-047	0.0004	U,a	0.0004	U,a	0.0004	U	0.0004	U	0.0004	U,a
PBDE-049	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-066	0.0002	U,a	0.0002	U,a	0.0002	U	0.0002	U	0.0002	U,a
PBDE-071	0.00045	U,a	0.00045	U,a	0.00045	U	0.00045	U	0.00045	U,a
PBDE-099	0.0006	J,a	0.0006	J,a	0.0005	U	0.0005	J	0.0007	J,a*
PBDE-100	0.0004	J,a*	0.0005	U,a	0.0005	U	0.0005	U	0.0001	J,a*
PBDE-138	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	U,a
PBDE-153	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-154	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-183	0.001	U,a	0.001	U,a	0.001	U	0.001	U	0.001	J,a*
PBDE-184	0.0005	U,a	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-191	0.001	U,a	0.0005	U,a	0.001	U	0.0005	U	0.0005	U,a
PBDE-209	0.0015	U,a	0.0015	U,a	0.0015	U	0.0015	U	0.0015	U,a

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 41. Concentrations of PBDEs (in ug/L) in runoff from rain event 5.

PBDEs	Steep-Slope Panel		Low-Slope Panels							
	GST		EPD		PVC		TPO		GLO	
PBDE-047	0.0004	U,a	0.0004	U	0.0004	U,a	0.0004	U,a	0.0004	U
PBDE-049	0.0005	U,a	0.0005	U	0.0005	U,a	0.0005	U,a	0.0004	U
PBDE-066	0.0002	U,a	0.0002	U	0.0002	U,a	0.0002	U,a	0.0002	U
PBDE-071	0.0005	U,a	0.0005	U	0.0004	U,a	0.0005	U,a	0.0004	U
PBDE-099	0.0005	U,a	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U
PBDE-100	0.0005	U,a	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U
PBDE-138	0.0010	U,a	0.0010	U	0.0010	U,a	0.0010	U,a	0.0010	U
PBDE-153	0.0005	U,a	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U
PBDE-154	0.0005	U,a	0.0005	U	0.0005	U,a	0.0005	U,a	0.0005	U
PBDE-183	0.0010	U,a	0.0010	U	0.0005	U,a	0.0010	U,a	0.0005	U
PBDE-184	0.0005	U,a	0.0005	U	0.0023	J,a*	0.0005	U,a	0.0005	U
PBDE-191	0.0010	U,a	0.0005	U	0.0005	U,a	0.0010	U,a	0.0005	U
PBDE-209	0.0015	U,a	0.0015	U	0.0015	U,a	0.0015	U,a	0.0015	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

* Values detected above the MDL in one replicate were averaged with values at 1/2 the MDL in replicate for the same compounds in replicate that were not detected.

Bold: Analyte detected above the MDL.

Table 42. Concentrations of PBDEs (in ug/L) in runoff from rain event 6.

PBDEs	Steep-Slope Panel		Low-Slope Panels							
	GST		EPD		PVC		TPO		GLO	
PBDE-047	0.0004	U	0.0004	U,a	0.0004	U	0.0004	U	0.0004	U,a
PBDE-049	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-066	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U	0.0002	U,a
PBDE-071	0.00045	U	0.00045	U,a	0.00045	U	0.00045	U	0.00045	U,a
PBDE-099	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-100	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-138	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
PBDE-153	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-154	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-183	0.001	U	0.001	U,a	0.001	U	0.001	U	0.001	U,a
PBDE-184	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-191	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U	0.0005	U,a
PBDE-209	0.0015	U	0.0015	U,a	0.0015	U	0.0015	J	0.0015	U,a

^A Average of three replicate asphalt shingle panels

^a Average of split samples

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL.

Table 43. Concentrations of PBDEs (in ug/L) in runoff from rain event 7.

PBDEs	Steep-Slope Panel		Low-Slope Panels							
	GST		EPD		PVC		TPO		GLO	
PBDE-047	0.0004	U	0.0004	U	0.0004	U,a	0.0004	U	0.0004	U
PBDE-049	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-066	0.0002	U	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U
PBDE-071	0.00045	U	0.00045	U	0.00045	U,a	0.00045	U	0.00045	U
PBDE-099	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-100	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-138	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
PBDE-153	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-154	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-183	0.001	U	0.001	U	0.001	U,a	0.001	U	0.001	U
PBDE-184	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-191	0.0005	U	0.0005	U	0.0005	U,a	0.001	U	0.0005	U
PBDE-209	0.0015	U	0.0015	U	0.0015	U,a	0.0015	U	0.0015	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Table 44. Concentrations of PBDEs (in ug/L) in runoff from rain event 8.

PBDEs	Steep-Slope Panel		Low-Slope Panels							
	GST		EPD		PVC		TPO		GLO	
PBDE-047	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U
PBDE-049	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-066	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U
PBDE-071	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-099	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-100	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-138	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
PBDE-153	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-154	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-183	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
PBDE-184	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-191	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
PBDE-209	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Table 45. Concentrations of PBDEs (in ug/L) in runoff from rain event 9.

PBDEs	Steep-Slope Panel		Low-Slope Panels							
	GST		EPD		PVC		TPO		GLO	
PBDE-047	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U,a
PBDE-049	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a
PBDE-066	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U,a
PBDE-071	0.00045	U	0.00045	U	0.00045	U	0.00045	U	0.00045	U,a
PBDE-099	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a
PBDE-100	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a
PBDE-138	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a
PBDE-153	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a
PBDE-154	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a
PBDE-183	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U,a
PBDE-184	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a
PBDE-191	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U,a
PBDE-209	0.0015	U	0.0015	U	0.0015	U	0.0015	U	0.0015	U,a

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Table 46. Concentrations of PBDEs (in ug/L) in runoff from rain event 10.

PBDEs	Steep-Slope Panel		Low-Slope Panels							
	GST		EPD		PVC		TPO		GLO	
PBDE-047	0.0004	U	0.0004	U	0.0004	U,a	0.0004	U	0.0004	U
PBDE-049	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-066	0.0002	U	0.0002	U	0.0002	U,a	0.0002	U	0.0002	U
PBDE-071	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-099	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-100	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-138	0.0010	U	0.0010	U	0.0010	U,a	0.0010	U	0.0010	U
PBDE-153	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-154	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-183	0.0010	U	0.0010	U	0.0010	U,a	0.0010	U	0.0010	U
PBDE-184	0.0005	U	0.0005	U	0.0005	U,a	0.0005	U	0.0005	U
PBDE-191	0.0010	U	0.0005	U	0.0005	U,a	0.0010	U	0.0010	U
PBDE-209	0.0015	U	0.0015	U	0.0015	U,a	0.0015	U	0.0015	U

^A Average of three replicate asphalt shingle panels

^a Average of split samples

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Table 47. SPLP metals concentrations (in ug/L) from first and second leaching.

Coupon Type	First SPLP leach					Second SPLP leach				
	Arsenic	Cadmium	Copper	Lead	Zinc	Arsenic	Cadmium	Copper	Lead	Zinc
ZIN-01	0.02 U	0.01 J	0.56 J	0.07 J	442	0.02 U	0.01 U	0.40 J	0.024 J	394
ZIN-02	0.10 J	0.02 J	0.36 J	0.10 J	385	0.11 J	0.01 U	0.28 J	0.009 J	289
ZIN-03	0.13 J	0.01 U	0.36 J	0.03 J	346	0.06 J	0.01 U	0.15 J	0.002 U	345
GAL-01	0.05 J	0.10 J	0.11 J	0.10 J	352	0.10 J	0.01 U	0.26 J	0.026 J	1,040
GAL-02	0.10 J	0.10 J	0.19 J	0.01 J	440	0.13 J	0.01 U	0.15 J	0.005 J	590
GAL-03	0.11 J	0.10 J	0.24 J	0.05 J	442	0.08 J	0.01 U	0.07 J	0.002 U	739
SNO-01	0.10 J	0.10 J	0.21 J	0.09 J	326	0.10 J	0.01 U	0.26 J	0.089 J	429
SNO-02	0.10 J	0.10 J	0.22 J	0.03 J	309	0.08 J	0.01 U	0.19 J	0.002 J	375
SNO-03	0.07 J	0.10 J	0.18 J	0.02 J	224	0.05 J	0.01 U	0.17 J	0.002 U	399
ASW-01	0.10 J	0.10 J	0.14 J	0.02 J	114 J	0.10 J	0.01 U	0.52 J	0.023 J	377
ASW-02	0.10 J	0.02 J	0.77 J	0.08 J	216	0.09 J	0.01 U	0.14 J	0.002 J	247
ASW-03	0.10 J	0.1 J	0.59 J	0.03 J	134	0.04 J	0.01 U	0.13 J	0.002 U	363
ESW-01	0.10 J	0.1 J	0.19 J	0.02 J	136 J	0.10 J	0.01 U	0.15 J	0.029 J	182
ESW-02	0.10 J	0.1 J	2.90 J	0.29	107 J	0.08 J	0.01 U	0.41 J	0.036 J	171
ESW-03	0.08 J	0.1 J	0.41 J	0.03 J	84	0.06 J	0.01 U	0.07 J	0.002 U	59
SIL-01	0.10 J	0.1 J	0.22 J	0.02 J	157 J	0.10 J	0.01 U	0.24 J	0.025 J	545
SIL-02	0.10 J	0.1 J	0.33 J	0.03 J	197	0.11 J	0.01 U	0.28 J	0.021 J	307
SIL-03	0.05 J	0.1 J	0.30 J	0.06 J	131	0.10 J	0.01 U	0.12 J	0.002 U	280
ALA-01	0.10 J	0.1 J	0.34 J	0.04 J	82 J	0.10 J	0.01 U	0.43 J	0.023 J	314
ALA-02	0.10 J	0.1 J	0.22 J	0.01 J	79 J	0.09 J	0.01 U	0.25 J	0.008 J	373
ALA-03	0.10 J	0.1 J	0.47 J	0.03 J	60	0.05 J	0.01 U	0.18 J	0.002 U	193
EPB-01	0.10 J	0.1 J	0.17 J	0.01 J	56 J	0.10 J	0.01 U	0.28 J	0.019 J	141
EPB-02	0.51	0.01 U	0.98 J	0.73	28 J	0.11 J	0.01 U	0.17 J	0.002 U	5.3 J
EPB-03	0.07 J	0.01 U	0.19 J	0.04 J	25	0.06 J	0.01 U	0.11 J	0.002 U	94
CUB-01	0.02 U	0.01 U	110	0.02 J	34 J	0.02 U	0.01 U	383	0.034 J	1.6 J
CUB-02	0.02 U	0.081 J	292	0.14 J	33 J	0.05 J	0.01 U	290	0.015 J	4.5 J
CUB-03	0.02 U	0.01 U	218	0.14 J	3.2 J	0.05 J	0.01 U	365	0.002 U	1.8 J
SYN-01	0.02 U	0.01 U	49	0.09 J	40 J	0.02 U	0.37	101	0.028 J	1.3 J
SYN-02	0.02 U	0.013 J	37	0.04 J	28 J	0.09 J	0.02 J	82.6	0.023 J	0.57 J
SYN-03	0.02 U	0.01 U	78	0.08 J	4.2 J	0.02 U	0.01 U	103	0.002 U	1.4 J
COR-01	0.02 U	0.01 U	82	0.01 J	11 J	0.02 U	0.01 U	183	0.043 J	1.7 J
COR-02	0.05 J	0.01 U	121	0.50	30 J	0.09 J	0.01 U	170	0.011 J	2.6 J
COR-03	0.08 J	0.01 U	87	0.06 J	1.6 J	0.10 J	0.01 U	113	0.002 U	0.62 J

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL

Coupon Type	1-Methylnaphthalene		2-Methylnaphthalene		Acenaphthene		Acenaphthylene		Anthracene		Benz[a]anthracene		Benzo(a)pyrene		Benzo(b)fluoranthene		Benzo(ghi)perylene		Benzo(k)fluoranthene		Chrysene		Dibenzo(a,b)anthracene		Fluoranthene		Fluorene		Indeno(1,2,3-cd)pyrene		Naphthalene		Phenanthrene		Pyrene	
SYN-03	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.003	J	0.001	U
COR-01	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
COR-02	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
COR-03	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL

Table 49. Concentrations of phthalates (in ug/L) in SPLP extract.

Coupon Type	Bis(2-ethylhexyl) phthalate		Butyl benzyl phthalate		Diethyl phthalate		Dimethyl phthalate		Di-N-butyl phthalate		Di-N-octyl phthalate	
GAL-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
GAL-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
GAL-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ZIN-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ZIN-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ZIN-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SNO-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SNO-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SNO-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ASW-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ASW-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ASW-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ESW-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ESW-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U

Coupon Type	Bis(2-ethylhexyl) phthalate		Butyl benzyl phthalate		Diethyl phthalate		Dimethyl phthalate		Di-N-butyl phthalate		Di-N-octyl phthalate	
ESW-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SIL-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SIL-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SIL-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ALA-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ALA -02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
ALA-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
EPB-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
EPB-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
EPB-03	0.046	U	0.009	U	0.28		0.007	U	0.005	U	0.005	U
CUB-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
CUB-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
CUB-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SYN-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SYN-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
SYN-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
COR-01	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
COR-02	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U
COR-03	0.046	U	0.009	U	0.009	U	0.007	U	0.005	U	0.005	U

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.
 Bold: Analyte detected above the MDL

Table 50. Concentrations of PBDEs (in ug/L) in SPLP extract.

Congener	EPB-04		EPB-05		EPB-06	
	Value	U	Value	U	Value	U
PBDE-047	0.0008	U	0.0008	U	0.0008	U
PBDE-049	0.001	U	0.001	U	0.001	U
PBDE-066	0.0004	U	0.0004	U	0.0004	U
PBDE-071	0.0009	U	0.0009	U	0.0009	U
PBDE-099	0.001	U	0.001	U	0.001	U
PBDE-100	0.001	U	0.001	U	0.001	U
PBDE-138	0.002	U	0.002	U	0.002	U
PBDE-153	0.001	U	0.001	U	0.001	U
PBDE-154	0.001	U	0.001	U	0.001	U
PBDE-183	0.002	U	0.002	U	0.002	U
PBDE-184	0.001	U	0.001	U	0.001	U
PBDE-191	0.002	U	0.002	U	0.002	U
PBDE-209	0.002	U	0.002	U	0.01	J

J: Value is an estimate

U: Analyte not detected at MDL. Value in table equals 1/2 of the MDL.

Bold: Analyte detected above the MDL