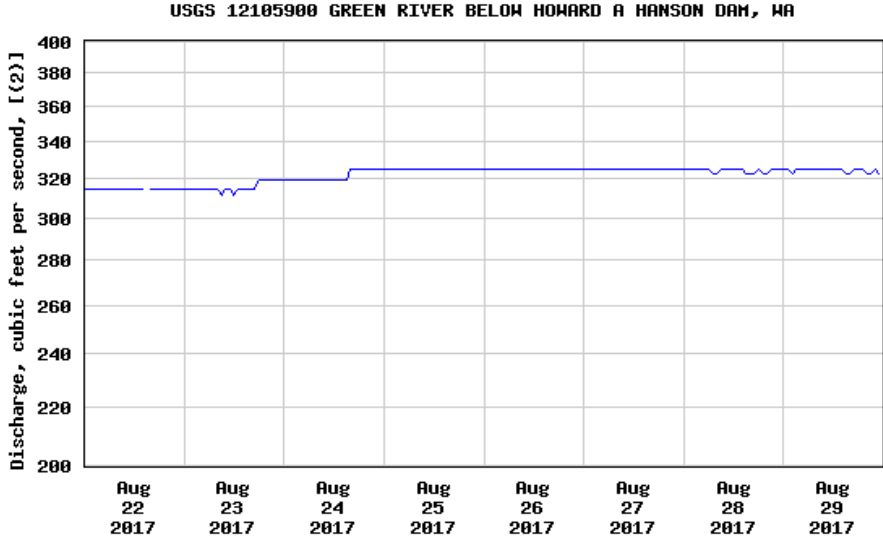
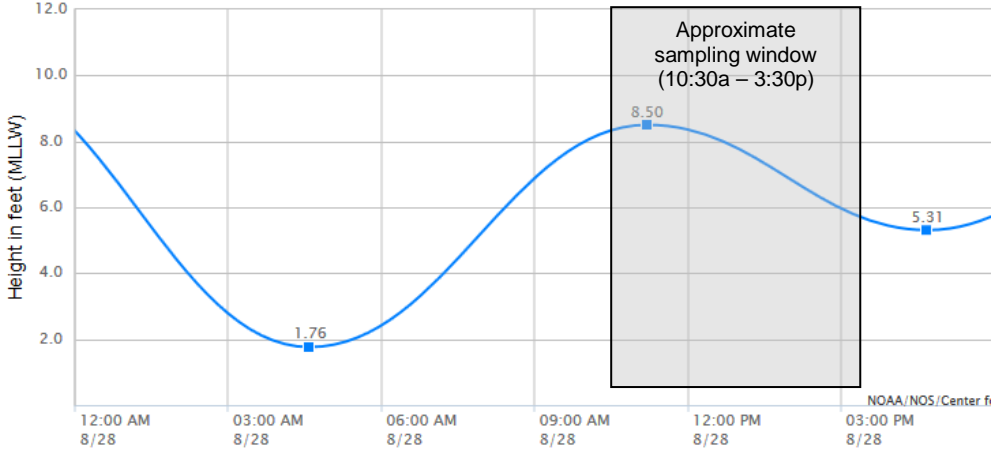


APPENDIX C. SAMPLING CONDITION SUMMARIES

Dry Baseflow Sampling Event (DB1) – August 28, 2017

Criteria	Actuals																		
<p>Precipitation – Successfully targeted 3-day antecedent period without measurable rainfall</p>	<p>0 inches of rainfall fell at the Hamm Creek gauge during the three-day antecedent period.</p>																		
<p>Dam discharge rate – Successfully targeted dry season average conditions (e.g., 200-600). Daily average on day of sampling was 325 cfs.</p>	 <p style="text-align: center;">USGS 12105900 GREEN RIVER BELOW HOWARD A HANSON DAM, WA</p> <table border="1"> <caption>USGS 12105900 Green River Discharge Data (Estimated)</caption> <thead> <tr> <th>Date</th> <th>Discharge (cfs)</th> </tr> </thead> <tbody> <tr><td>Aug 22, 2017</td><td>320</td></tr> <tr><td>Aug 23, 2017</td><td>320</td></tr> <tr><td>Aug 24, 2017</td><td>325</td></tr> <tr><td>Aug 25, 2017</td><td>325</td></tr> <tr><td>Aug 26, 2017</td><td>325</td></tr> <tr><td>Aug 27, 2017</td><td>325</td></tr> <tr><td>Aug 28, 2017</td><td>325</td></tr> <tr><td>Aug 29, 2017</td><td>325</td></tr> </tbody> </table>	Date	Discharge (cfs)	Aug 22, 2017	320	Aug 23, 2017	320	Aug 24, 2017	325	Aug 25, 2017	325	Aug 26, 2017	325	Aug 27, 2017	325	Aug 28, 2017	325	Aug 29, 2017	325
Date	Discharge (cfs)																		
Aug 22, 2017	320																		
Aug 23, 2017	320																		
Aug 24, 2017	325																		
Aug 25, 2017	325																		
Aug 26, 2017	325																		
Aug 27, 2017	325																		
Aug 28, 2017	325																		
Aug 29, 2017	325																		
<p>Tides and Sample Timing – Sampling window was somewhat delayed relative to target sampling times due to boat software issues (impacting both for the GPS system and YSI meter). Samples were collected as close to the high tide period as possible, and tides remained relatively high during the sampling window.</p>	 <p style="text-align: center;">Approximate sampling window (10:30a – 3:30p)</p> <table border="1"> <caption>Tide Height Data (MLLW)</caption> <thead> <tr> <th>Time</th> <th>Height (feet)</th> </tr> </thead> <tbody> <tr><td>03:00 AM 8/28</td><td>1.76</td></tr> <tr><td>09:00 AM 8/28</td><td>8.50</td></tr> <tr><td>03:00 PM 8/28</td><td>5.31</td></tr> </tbody> </table>	Time	Height (feet)	03:00 AM 8/28	1.76	09:00 AM 8/28	8.50	03:00 PM 8/28	5.31										
Time	Height (feet)																		
03:00 AM 8/28	1.76																		
09:00 AM 8/28	8.50																		
03:00 PM 8/28	5.31																		
<p>Tide Type – Spring vs. neap</p>	<p>Samples were collected during a neap tide, meaning that the next dry baseflow event (DB2) will be scheduled around a spring tide.</p>																		

Grab collection times were as follows (overall sampling window from 10:30 am to 3:30 pm on August 28):

Location	Sampling Depth	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface	1128	12.0	1229	nr	1334	nr	1438	nr
	near-bottom	1045	13.2	1157	13.1	1305	12.9	1405	12.8
SW2	near-surface	1138	9.7	1240	9.6	1359	9.1	1524	8.8
	near-bottom	1029/ 1110	9.5/9.7	1155/ 1216	9.7	1301/ 1324	9.5/9.3	1439/ 1459	9.0
SW3	mid-depth	1157	4.5	1303	4.2	1403	4.1	1506	4.0

Note: SW1, SW2, and SW3 are located at RM 0.75, 3.3, and 10, respectively.

The planned start time for this sampling event was delayed because of an issue with the navigation software on one of the two sampling boats, which resulted in the collection of the first surface grab samples at SW1 and SW2 just after the high tide. Sampling at SW2 was further delayed by a malfunction of the boat's A-frame, meaning that it was necessary to manually deploy the Niskin bottle sampler for the third and fourth grab samples.

Storm Sampling Event without Significant Dam Release (ST1) – September 19, 2017

Criteria	Actuals / Sampling Notes
<p>Target Precipitation – Storm with ≥ 0.25 in. in 24-hour period with 48-hour antecedent period without heavy rainfall (i.e., less than 0.2 inches).</p>	<p>Rainfall forecast information is from the NWS (green bars indicate probability of rainfall). The forecast shown below (from 3 pm on Sunday, September 17), indicated a moderate spike in precipitation on Monday, September 18, and heavier rainfall on Monday night/Tuesday morning. Based on this forecast (and the updated forecast from Monday; not shown), sampling was targeted for Tuesday morning, September 19 (as shown by the red box on the figure below).</p>
<p>Actual Precipitation – <u>48-hour antecedent period</u> = 0.11 inches fell from 6:30 pm on Saturday, September 16, through 6:30 pm on Monday, September 18 (i.e., the start of storm). <u>Storm precipitation</u> = From the start of the storm on Monday, September 18 (6:30 pm) through the completion of sampling on Tuesday, September 19 (3:45 pm), 0.35 inches of rain was recorded at the Hamm Creek gauge. Of this rainfall, 0.03 inches fell during the sampling period (approximately 10 am-3:45 pm on September 19). <u>24-hour rainfall</u> = 0.35 inches was recorded during the 24 hours ending at the completion of sampling (3:45 pm on September 18 to 3:45 pm on September 19). <u>Period of maximum intensity</u> = Sampling was conducted within 12 hours of the storm's maximum intensity (6 pm on Monday, September 18 to 3 am on Tuesday, September 19), during which 0.27 inches of rain was recorded.</p>	<p>Successfully targeted storm with ≥ 0.25 in. in 24-hour period with 48-hour antecedent period without heavy rainfall. Precipitation data are from the Hamm Creek gauge, located near the LDW. The gray-shaded box indicates the period from sunset (7:14 pm) to sunrise (6:52 am), during which no sampling could be conducted.</p> <p>A small amount of rain (0.11 inches) fell from Sunday afternoon (September 17) through early Monday morning (September 18). The forecasted storm event began at 6:30 pm on Monday (September 18). The storm's maximum intensity occurred from about 6:30 pm on Monday, September 18, to 3 am on Tuesday, September 19, during which 0.27 inches of rain was recorded at the Hamm Creek gauge. Sampling was conducted as soon as possible after this period of maximum intensity and after sunrise (i.e., samples were collected from about 10 am to 3:45 pm on Tuesday, September 19).</p>

Criteria	Actuals / Sampling Notes
<p>Dam discharge rate – Successfully targeted storm event without significant dam release (< 2,000 cfs). Daily average on day of sampling was 319 cfs.</p>	<p align="center">USGS 12105900 GREEN RIVER BELOW HOWARD A HANSON DAM, WA</p> <p>Discharge, cubic feet per second, [(2)]</p> <p>Sep 12 2017, Sep 13 2017, Sep 14 2017, Sep 15 2017, Sep 16 2017, Sep 17 2017, Sep 18 2017, Sep 19 2017</p>
<p>Tides and Sample Timing – As described in the QAPP, no requirement exists for the timing of sample collection around tides during storm events. However, this information is provided for informational purposes.</p>	<p>Height in feet (MLLW)</p> <p>12:00 AM 9/18, 08:00 AM 9/18, 04:00 PM 9/18, 12:00 AM 9/19, 08:00 AM 9/19, 04:00 PM 9/19</p> <p>NOAA/</p>
<p>Duwamish flow conditions – Although not a criteria for sampling, the flow rates for the Green/Duwamish River were evaluated to determine impact of storm on river flow. Rainfall appears to have resulted in increased discharge rates.</p>	<p align="center">USGS 12113344 GREEN RIVER AT 200TH STREET AT KENT, WA</p> <p>Discharge, cubic feet per second</p> <p>Sep 12 2017, Sep 13 2017, Sep 14 2017, Sep 15 2017, Sep 16 2017, Sep 17 2017, Sep 18 2017, Sep 19 2017</p> <p>----- Provisional Data Subject to Revision -----</p> <p>▲ Median daily statistic (5 years) — Discharge</p>

Grab collection times were as follows (overall sampling window from 10 am to 3:45 pm on September 19):

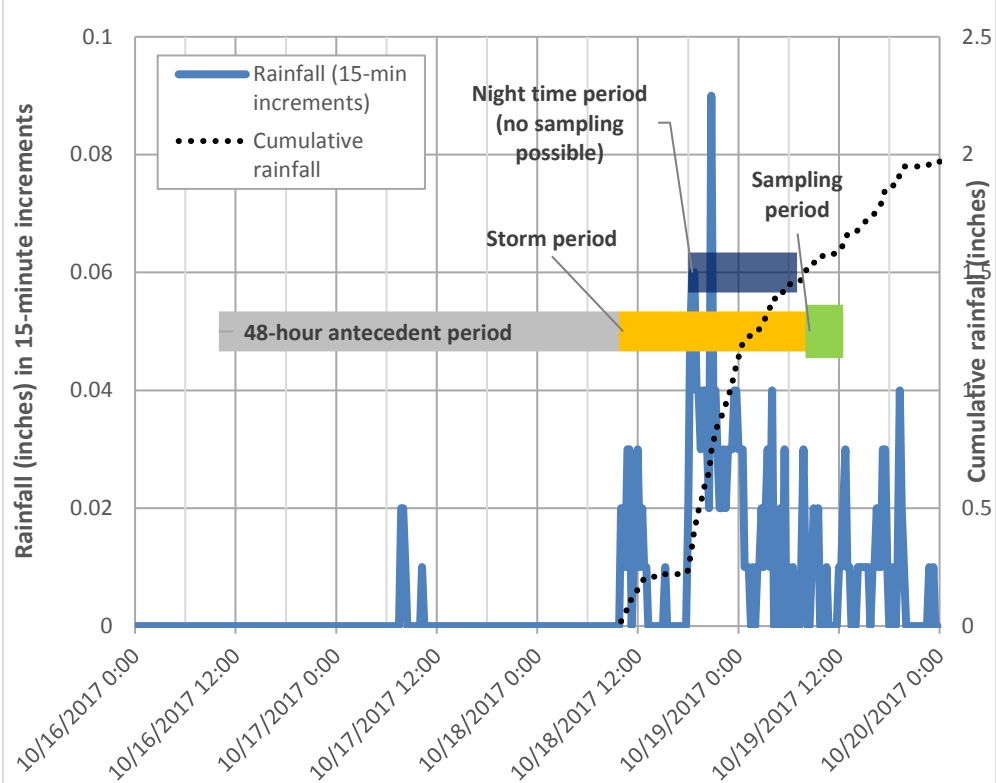
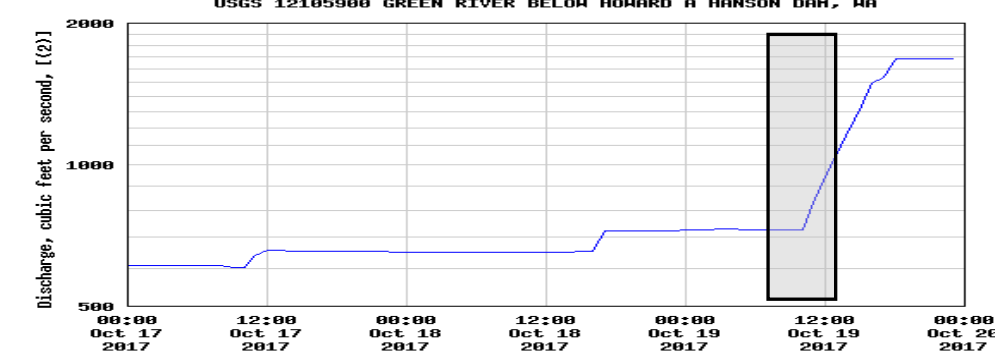
Location	Sampling Depth	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface	1042	11.5	1141	10.3	1237	11.0	1340	11.7
	near-bottom	1010	10.6	1111	10.4	1209	10.8	1312	11.4
SW2	near-surface	1031	7.6	1138	6.9	1246	7.5	1346	8.1
	near-bottom	1008	7.6	1121	7.0	1223	7.6	1322	8.1
SW3	mid-depth	1130	3.5	1330/ 1400	3.4	1445/ 1455	3.6	1541/ 1545	4.1

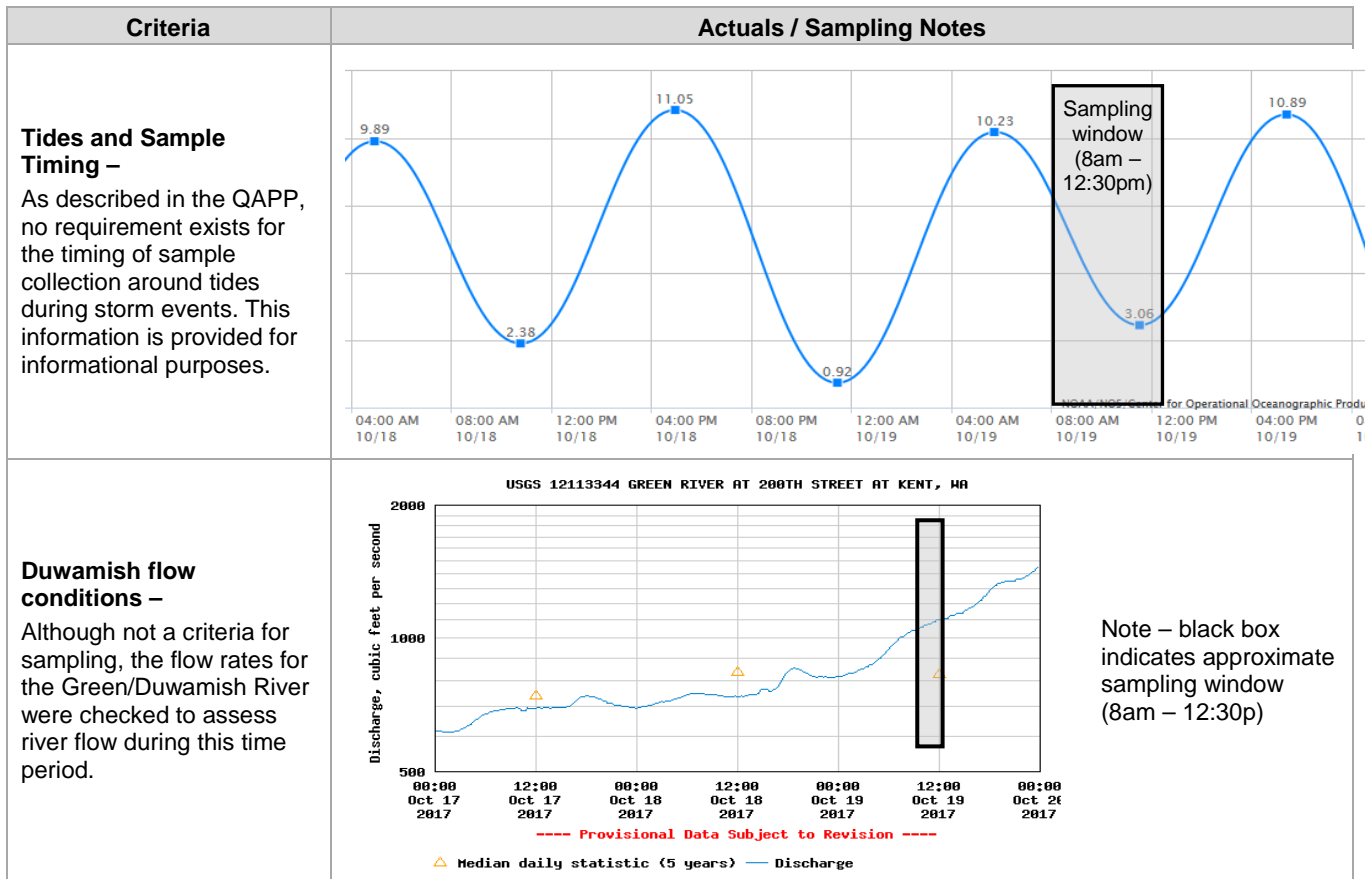
Note: SW1, SW2, and SW3 are located at RM 0.75, 3.3, and 10, respectively.

Sampling at SW3 was slightly delayed after collection of the first grab sample because of a malfunction and resulting breakage of the 5-L Niskin bottle sampler. Thus, two grab collection times are reported.

Storm Sampling Event without Significant Dam Release (ST2) – October 19, 2017

Criteria	Actuals / Sampling Notes																																																			
<p>Target Precipitation – Storm with ≥ 0.5 in. in 24-hour period with 48-hour antecedent period without heavy rainfall (i.e., less than 0.2 inches).</p>	<p>Rainfall forecast information is from the NWS (green bars are probability of rainfall). The forecast shown below from Tuesday, October 17, shows a relatively dry period overnight on Tuesday, with moderate rain starting early morning on Wednesday, October 18. Rain was forecasted to increase moving into Wednesday evening, with the heaviest rainfall forecasted for overnight on Wednesday, October 18 (11 pm to 5 am). Based on this forecast, sampling was scheduled for first thing on Thursday, October 19 (as shown by the red box on the figure below).</p> <p>The chart displays the following data points for precipitation potential and actual rainfall:</p> <table border="1"> <thead> <tr> <th>Time</th> <th>Precipitation Potential (%)</th> <th>Actual Rainfall (in)</th> </tr> </thead> <tbody> <tr><td>3pm Oct 18</td><td>73%</td><td>0.01</td></tr> <tr><td>6pm Oct 18</td><td>65%</td><td>0.01</td></tr> <tr><td>9pm Oct 18</td><td>74%</td><td>0.01</td></tr> <tr><td>12pm Oct 18</td><td>84%</td><td>0.01</td></tr> <tr><td>3am Oct 18</td><td>87%</td><td>0.01</td></tr> <tr><td>6am Oct 18</td><td>94%</td><td>0.08</td></tr> <tr><td>9am Oct 18</td><td>82%</td><td>0.24</td></tr> <tr><td>12pm Oct 18</td><td>100%</td><td>0.35</td></tr> <tr><td>3pm Oct 18</td><td>100%</td><td>0.07</td></tr> <tr><td>6pm Oct 18</td><td>100%</td><td>0.07</td></tr> <tr><td>9pm Oct 18</td><td>100%</td><td>0.07</td></tr> <tr><td>12pm Oct 18</td><td>100%</td><td>0.07</td></tr> <tr><td>3am Oct 19</td><td>100%</td><td>0.07</td></tr> <tr><td>6am Oct 19</td><td>100%</td><td>0.07</td></tr> <tr><td>9am Oct 19</td><td>100%</td><td>0.44</td></tr> <tr><td>12pm Oct 19</td><td>100%</td><td>0.44</td></tr> </tbody> </table>	Time	Precipitation Potential (%)	Actual Rainfall (in)	3pm Oct 18	73%	0.01	6pm Oct 18	65%	0.01	9pm Oct 18	74%	0.01	12pm Oct 18	84%	0.01	3am Oct 18	87%	0.01	6am Oct 18	94%	0.08	9am Oct 18	82%	0.24	12pm Oct 18	100%	0.35	3pm Oct 18	100%	0.07	6pm Oct 18	100%	0.07	9pm Oct 18	100%	0.07	12pm Oct 18	100%	0.07	3am Oct 19	100%	0.07	6am Oct 19	100%	0.07	9am Oct 19	100%	0.44	12pm Oct 19	100%	0.44
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Criteria	Actuals / Sampling Notes
<p>Actual Precipitation – 48-hour antecedent period = 0.06 inches fell from 10 am on Monday, October 16, through 10 am on Wednesday, October 18 (i.e., the start of storm).</p> <p>Storm precipitation = From the start of the storm (10 am on Wednesday, October 18) through the completion of sampling on Thursday, October 19 (12:30 pm), 1.62 inches of rain was recorded at the Hamm Creek gauge. Of this rainfall, 0.12 inches fell during the sampling period (approximately 8 am-12:30 pm on October 19).</p> <p>24-hour rainfall = 1.43 inches was recorded during the 24 hours ending at the completion of sampling (12:30 pm on October 18 to 12:30 pm on October 19).</p> <p>Period of maximum intensity = Sampling was conducted within 12 hours of the storm's maximum intensity (6 pm on Wednesday, October 18 to 12:30 am on Thursday, October 19), during which 0.98 inches of rain was recorded at the Hamm Creek gauge.</p>	<p>Successfully targeted storm with ≥ 0.5 in. in 24-hour period with 48-hour antecedent period without heavy rainfall. Precipitation data are from the Hamm Creek gauge, located near the LDW. The gray-shaded box indicates the period from sunset (6:15pm) to sunrise (7:30am), during which no sampling could be conducted.</p>  <p>The chart displays rainfall in 15-minute increments (blue bars) and cumulative rainfall (black dotted line) from October 16 to October 20, 2017. The left y-axis shows rainfall in 15-minute increments (0 to 0.1 inches), and the right y-axis shows cumulative rainfall in inches (0 to 2.5 inches). Key features include: a gray-shaded 'Night time period (no sampling possible)' from approximately 6:15 pm to 7:30 am on October 19; a yellow-shaded '48-hour antecedent period' from 10:00 am on October 16 to 10:00 am on October 18; a green-shaded 'Storm period' from 10:00 am on October 18 to 12:30 pm on October 19; and a blue-shaded 'Sampling period' from 8:00 am to 12:30 pm on October 19.</p> <p>A small amount of rain (0.06 inches) fell on Tuesday (October 17) morning from about 7:45 am to 10:15 am. The forecasted storm event began at 10 am on Wednesday, October 18. During the initial portion of the storm (10 am to 1:30 pm on Wednesday, October 18), 0.21 inches of rain was recorded at the Hamm Creek gauge. After that time, 0.01 inches fell until about 6 pm on Wednesday, October 18, at which point the storm's intensity increased. The storm's maximum intensity occurred from 6 pm on October 18 to 12:30 am on October 19, during which 0.98 inches of rain was recorded at the Hamm Creek gauge. Sampling was conducted as soon as possible after this period of maximum intensity and after sunrise (i.e., samples were collected on Thursday, October 19 from 8 am to 12:30 pm).</p>
<p>Dam discharge rate – Storm event without significant dam release (< 2,000 cfs).</p>	<p>Successfully targeted storm event with > 0.5 inches without significant dam release (< 2,000 cfs). Release rate went from 726 cfs at the beginning of sampling to 941 cfs at the end of sampling. Black box indicates approximate sampling window (8 am – 12:30 pm on Thursday, October 19).</p>  <p>The chart shows discharge in cubic feet per second (cfs) for USGS 12185988 Green River below Howard A Hanson Dam, WA, from October 17 to October 20, 2017. The y-axis ranges from 500 to 2000 cfs. A black box highlights the sampling window from 8:00 am to 12:30 pm on October 19, 2017, where the discharge rate increases from approximately 726 cfs to 941 cfs. A red dashed line at the bottom indicates 'Provisional Data Subject to Revision'.</p>



Grab collection times were as follows (overall sampling window from approximately 8 am to 12:30 pm on October 19):

Location	Sampling Depth ^a	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface	0812	12.6	1013	11.7	1105	11.5	1201	11.5
	near-bottom ^b	0947	12.0	1045	11.5	1140	11.4	1239	11.8
SW2	near-surface	0841	8.8	0956	8.0	1057	7.5	1159	7.8
	near-bottom	0806	8.8	0928	8.3	1028	7.9	1129	7.6
SW3	mid-depth	0920	5.0	1015	5.1	1115	4.9	1215	4.5

Notes: Due to sampling equipment issues (i.e., messenger was not triggering Niskin sampler), samples at SW1 were delayed after collection of first surface grab. This issue required assistance from crew at SW2, and thus samples from both locations were impacted by this issue.

Wet Baseflow Sampling Event (WB1) – February 22, 2018

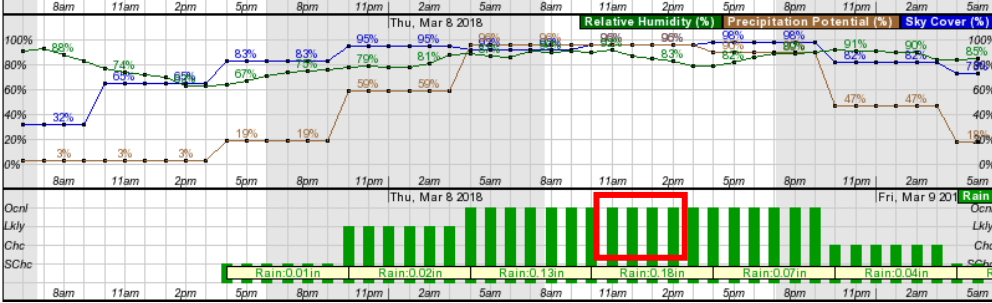
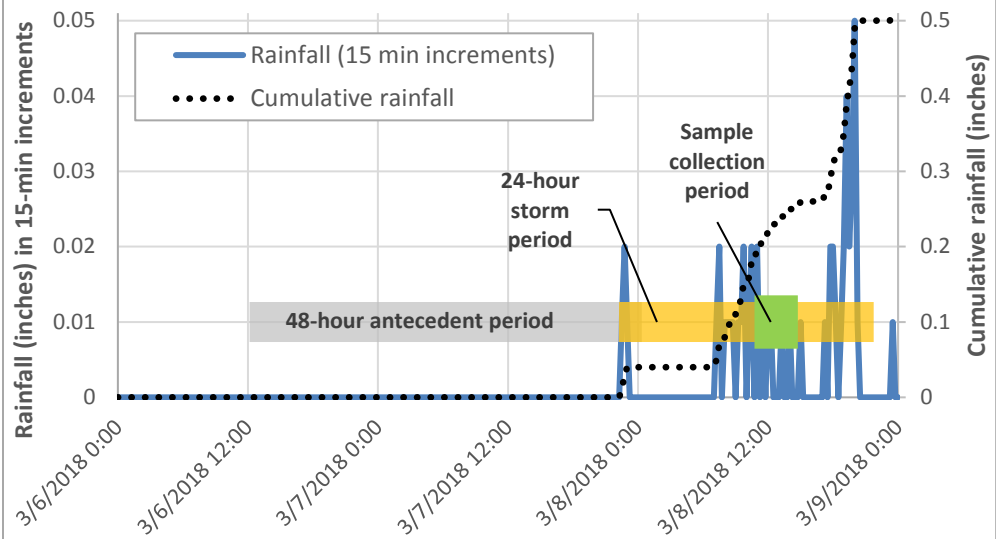
Criteria	Actuals
<p>Target Precipitation – 3-day antecedent period without measurable rainfall</p>	<p>A total of 0.05 inches of precipitation was recorded at the Hamm Creek gage between 8:30 am and 9:30 am on Thursday, February 22, as a result of the approximately one-half inch of snow that fell in the LDW area from about 6 pm on February 21 to 1 am on February 22 (the precipitation was not recorded on the Hamm Creek gage until the snow melted in the morning). Other than the small amount of snow, no measurable precipitation was recorded during the 3-day antecedent period (no rain had been recorded at the Hamm Creek gage since about noon on Sunday, February 18). Prior to sampling, EPA/Ecology confirmed that these conditions acceptable.</p>
<p>Dam discharge rate – Wet-season average flow conditions (e.g., 800-1,200 cfs)</p>	<p>Successfully targeted wet season average conditions (e.g., 800-1200 cfs). Daily average on day of sampling was 1,120 cfs. The dam release decreased from 1,257 to 1,106 cfs during the sample collection period. Black box indicates the approximate sampling period (8 am-noon).</p> <p style="text-align: center;">USGS 12105900 GREEN RIVER BELOW HOWARD HANSON DAM, WA</p> <p style="text-align: center;">---- Provisional Data Subject to Revision ----</p> <p style="text-align: center;">△ Median daily statistic (57 years) — Discharge</p>
<p>Tides and Sample Timing – Sample collection should be approximately centered on the high tide.</p>	<p>Samples were collected on February 22 from approximately 8 am to noon, around the high tide at 9:11 am (sample collection started as early as possible during daylight conditions).</p> <p style="text-align: center;">NOAA/NOS/Center for Operational Oceanographic Products and Services</p>
<p>Tide Type – Spring vs. neap</p>	<p>Samples were collected during a neap tide period, meaning that the next wet baseflow event (WB2) will target a spring tide.</p>

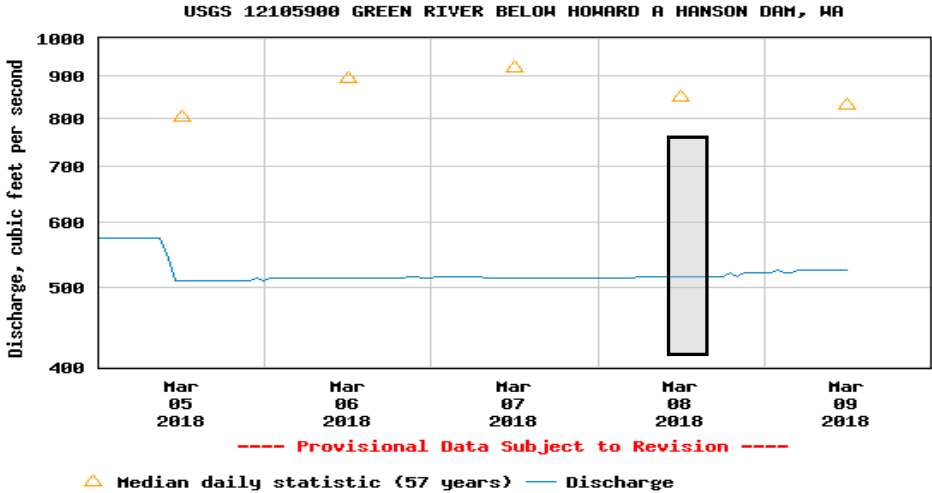
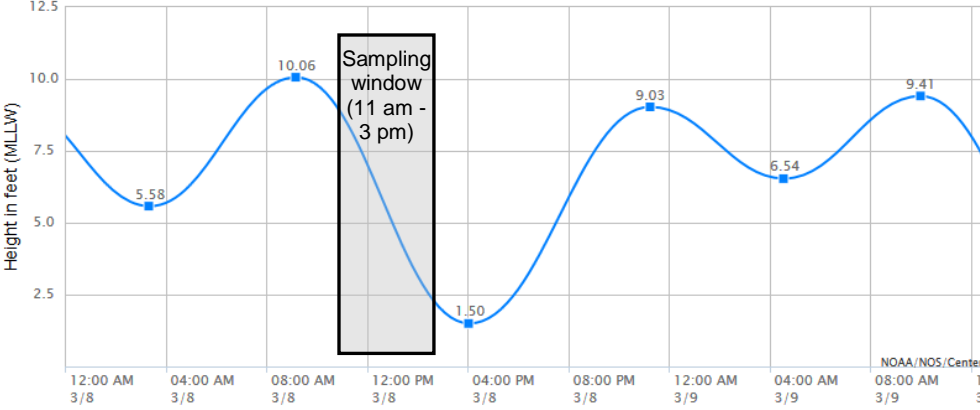
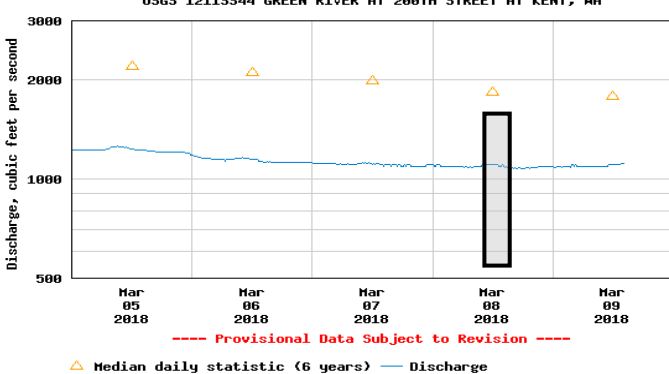
Grab collection times were as follows (overall sampling window from 8 am to noon on February 22):

Location	Sampling Depth	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface	0900	16.2	1008	16.0	1112	10.5	1310	11.6
	near-bottom	0830	16.0	0940	16.4	1040	11.2	1140	12.1
SW2	near-surface	0808	10.0	0905	10.0	1002	9.7	1058	9.5
	near-bottom	0840	9.7	0938	10.0	1033	9.7	1137	9.1
SW3	mid-depth	0925	6.8	1020	6.5	1122	6.6	1206	6.0

There was an approximately 1-hour delay in the timing of the collection of the fourth near-surface grab sample at SW1 because the battery on the sampling boat was drained. The fourth grab at SW1 was delayed until the boat that had completed sampling at SW2 was able to arrive to collect this grab.

Storm Sampling Event without Significant Dam Release (ST3) – March 8, 2018

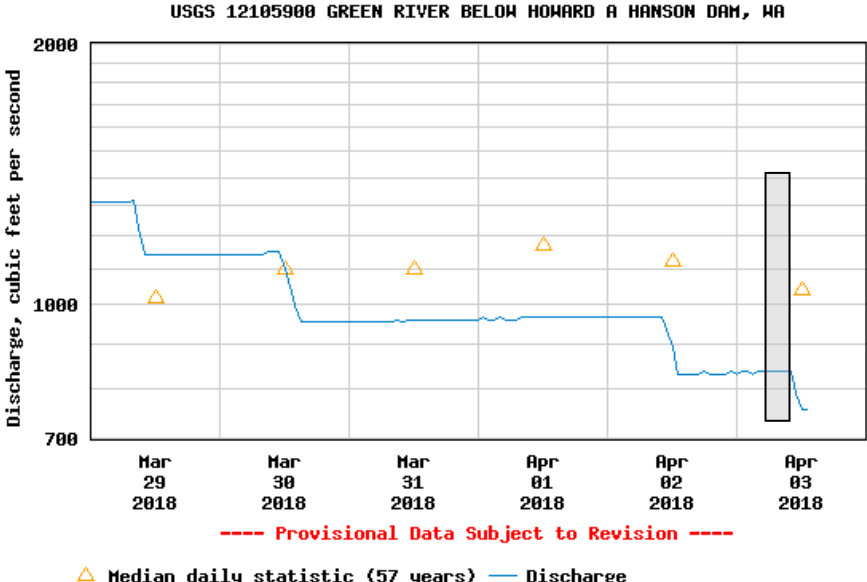
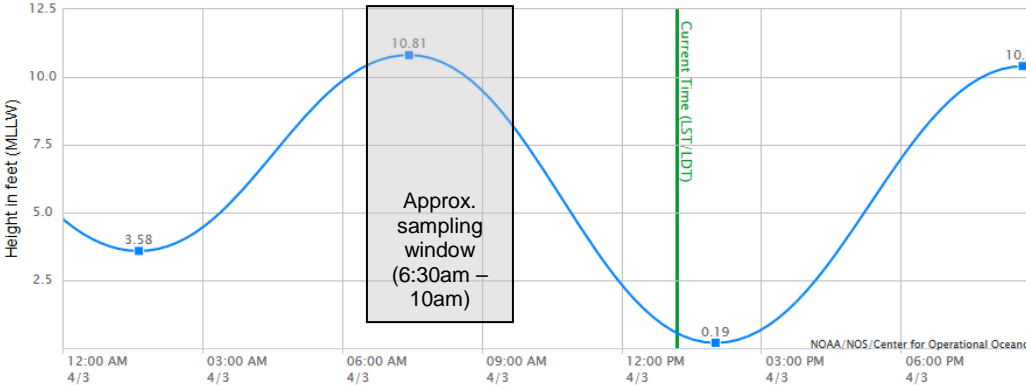
Criteria	Actuals / Sampling Notes
<p>Target Precipitation – Storm with ≥ 0.25 in. in 24-hour period with 48-hour antecedent period without heavy rainfall (i.e., less than 0.2 inches).</p>	<p>Sample collection timing was based on the forecast and Doppler radar. The forecast shown below from Wednesday, March 7, shows light rainfall starting as early as 4 pm on Wednesday, with more significant rainfall from 4 am to 10 am, and even higher amounts from 10 am to 4 pm. Based on this forecast, sampling was scheduled to begin around 11 am on Thursday, March 8 (as shown by the red box on the figure below), to target the beginning of the highest intensity rainfall. Rainfall forecast information is from the NWS (green bars are probability of rainfall).</p> 
<p>Actual Precipitation – <u>48-hour antecedent period</u> = no rain was recorded during the antecedent period (i.e., from 10 pm on Monday, March 5, through 10 pm on Wednesday, March 7 (i.e., the start of storm)). <u>24-hour rainfall</u> = 0.5 inches was recorded during the 24-hour storm period (10 pm on March 7 to 10 pm March 8). Of this rainfall, 0.26 inches fell before and during sample collection. <u>Period of maximum intensity</u> = Sampling was conducted within the storm's first high intensity period, which occurred from 7 am to 2 pm on March 8, during which 0.19 inches of rain was recorded at the Hamm Creek gauge.</p>	<p>Successfully targeted storm with ≥ 0.25 in. of rainfall in a 24-hour period, with a 48-hour antecedent period without heavy rainfall. Precipitation data are from the Hamm Creek gauge, located near the LDW.</p>  <p>The storm started with a small amount of rain (0.04 inches), which fell between 10 pm and midnight on Wednesday, March 7. The primary part of the storm began at 7 am on Thursday, March 8. From 7 am to the end of sample collection, an additional 0.22 inches of rain was recorded. After sampling ended, another 0.24 inches of rain was recorded. Two heavier periods of maximum intensity were recorded: the first occurred from about 7 am to 1 pm (0.19 inches), and the second occurred from about 5 pm to 9 pm (0.24 inches). Sampling was conducted within the first period of higher intensity (11 am to 3 pm).</p>

Criteria	Actuals / Sampling Notes	
<p>Dam discharge rate – Storm event without significant dam release (< 2,000 cfs).</p>	<p>Successfully targeted storm event with > 0.25 inches of rain without significant dam release (< 2,000 cfs). Release rate was approximately 515 cfs throughout the sampling period. Black box indicates approximate sampling window (11am – 3pm on Thursday, March 8).</p>  <p>USGS 12105900 GREEN RIVER BELOW HOWARD A HANSON DAM, WA</p> <p>Discharge, cubic feet per second</p> <p>1000 900 800 700 600 500 400</p> <p>Mar 05 2018 Mar 06 2018 Mar 07 2018 Mar 08 2018 Mar 09 2018</p> <p>----- Provisional Data Subject to Revision -----</p> <p>△ Median daily statistic (57 years) — Discharge</p>	
<p>Tides and Sample Timing – As described in the QAPP, no requirement exists for the timing of sample collection around tides during storm events. This information is provided for informational purposes.</p>	 <p>Height in feet (MLLW)</p> <p>12.5 10.0 7.5 5.0 2.5</p> <p>12:00 AM 3/8 04:00 AM 3/8 08:00 AM 3/8 12:00 PM 3/8 04:00 PM 3/8 08:00 PM 3/8 12:00 AM 3/9 04:00 AM 3/9 08:00 AM 3/9</p> <p>NOAA/NOS/Center 1</p> <p>5.58 10.06 1.50 9.03 6.54 9.41</p> <p>Sampling window (11 am - 3 pm)</p>	
<p>Duwamish flow conditions – Although not a criteria for sampling, the flow rates for the Green/Duwamish River were checked to assess river flow during this time period.</p>	 <p>USGS 12113344 GREEN RIVER AT 200TH STREET AT KENT, WA</p> <p>Discharge, cubic feet per second</p> <p>3000 2000 1000 500</p> <p>Mar 05 2018 Mar 06 2018 Mar 07 2018 Mar 08 2018 Mar 09 2018</p> <p>----- Provisional Data Subject to Revision -----</p> <p>△ Median daily statistic (6 years) — Discharge</p>	<p>Note – black box indicates approximate sampling window (11am – 3p)</p>

Grab collection times were as follows (overall sampling window from approximately 11 am to 3 pm on Thursday, March 8):

Location	Sampling Depth	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface	1130	13.0	1230	12.9	1327	12.5	1434	11.9
	near-bottom	1058	13.6	1208	12.9	1300	12.1	1358	11.9
SW2	near-surface	1051	9.1	1150	9.0	1305	8.2	1354	8.1
	near-bottom	1121	9.1	1219	8.8	1331	8.2	1426	7.6
SW3	mid-depth	1155	6.1	1255	5.7	1345	5.6	1450	5.4

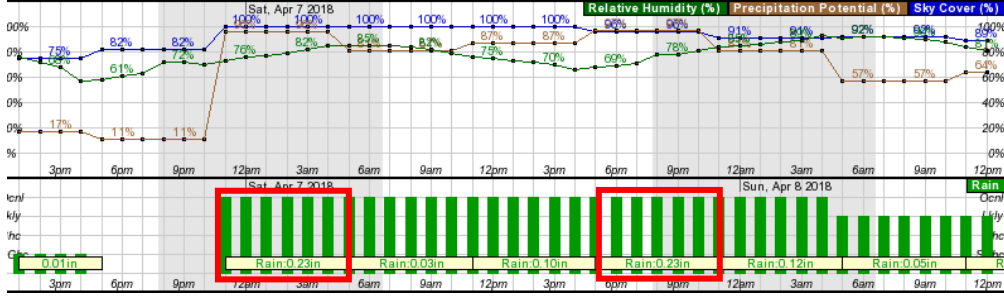
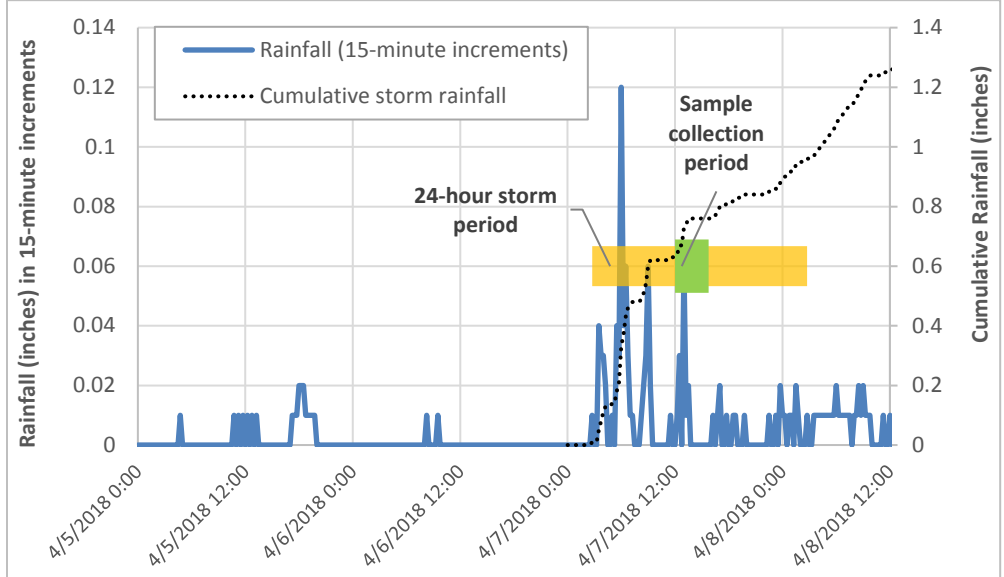
Wet Baseflow Sampling Event (WB2) – April 3, 2018

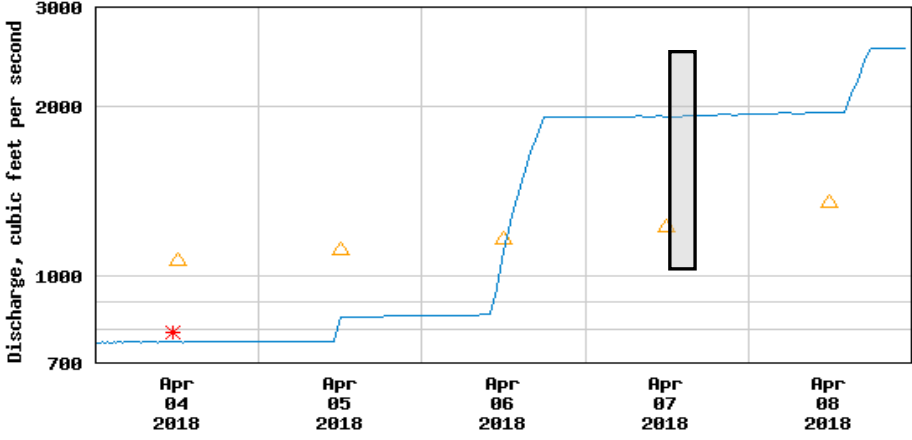
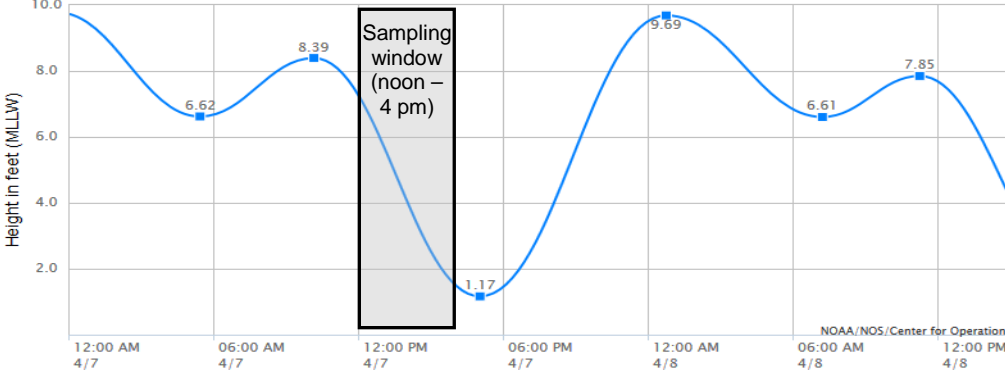
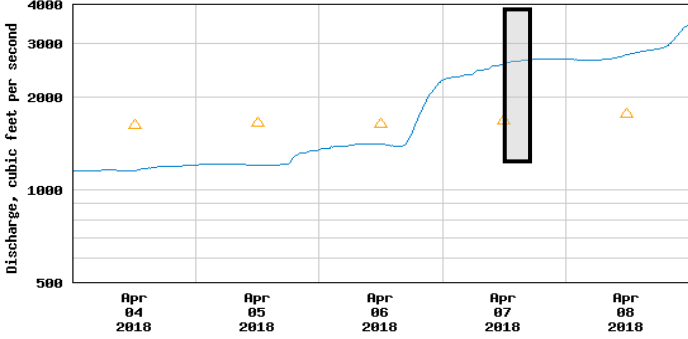
Criteria	Actuals
Target Precipitation – 3-day antecedent period without measurable rainfall	No measurable precipitation was recorded during the 3-day antecedent period (the last recorded precipitation occurred at about 2 pm on Wednesday, March 28).
Dam discharge rate – Wet-season average flow conditions (e.g., 800-1,200 cfs)	Successfully targeted wet season average conditions (e.g., 800-1200 cfs). The dam release rate was about 837 cfs during the sample collection period (approximately 6:30 am to 10 am).  <p style="text-align: center;">USGS 12105900 GREEN RIVER BELOW HOWARD A HANSON DAM, WA</p> <p style="text-align: center;">---- Provisional Data Subject to Revision ----</p> <p style="text-align: center;">△ Median daily statistic (57 years) — Discharge</p>
Tides and Sample Timing – Sample collection should be approximately centered on the high tide.	Samples were collected on April 3 from approximately 6:30 am to 10 am, around the high tide at 7:25 am (sample collection started as early as possible in daylight).  <p style="text-align: center;">Approx. sampling window (6:30am – 10am)</p> <p style="text-align: right; font-size: small;">NOAA/NOS/Center for Operational Oceanogr</p>
Tide Type – Spring vs. neap	Samples were collected during a spring tide period (WB1 samples were collected during a neap tide).

Grab collection times were as follows (overall sampling window from 6:30 am to 10 am on April 3):

Location	Sampling Depth ^a	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface	0658	8.4	0753	8.4	0859	8.4	0955	8.3
	near-bottom ^b	0635	8.2	0731	8.5	0844	8.5	0940	8.3
SW2	near-surface	0712	10.4	0812	10.2	0914	9.8	1018	9.1
	near-bottom	0651	10.4	0752	10.4	0852	10.0	0951	9.6
SW3	mid-depth	0715	5.9	0815	6.6	0910	5.9	1005	6.0

Storm Sampling Event with Significant Dam Release (ST4) – April 7, 2018

Criteria	Actuals / Sampling Notes
<p>Target Precipitation – Storm with ≥ 0.5 in. in 24-hour period. No antecedent period required.</p>	<p>Sample collection timing was based on the forecast and actual conditions on the morning of Saturday, April 7 (i.e., the Doppler radar and rainfall recorded to date). The forecast shown below from Friday, April 6, shows two periods of higher intensity rainfall, one early Saturday morning and the other on Saturday evening (shown with red boxes below). Based on this forecast, the sampling team was prepared to mobilize either mid-day Saturday (depending on conditions first thing on Saturday) or first thing on Sunday morning to target sampling within 12 hours of either period of forecasted peak intensity. Rainfall forecast information is from the NWS (green bars are probability of rainfall).</p> 
<p>Actual Precipitation – <u>24-hour rainfall</u> = 0.95 inches was recorded during the 24-hour storm period (2 am on Saturday, April 7, to 2 am on Sunday, April 8). Of this rainfall, 0.76 inches fell before and during sample collection. <u>Period of maximum intensity</u> = Several high-intensity periods of rain occurred from about 3:30 am to 1 pm on Saturday, April 7. Sampling was conducted within 12 hours of these peak intensity periods.</p>	<p>Successfully targeted storm with ≥ 0.5 in. of rainfall in a 24-hour period. Precipitation data are from the Hamm Creek gauge, located near the LDW.</p>  <p>No antecedent dry period was required for ST4, although only 0.23 inches fell during the 2 days prior to the storm. The 24-hour storm period started at 2:45 am on Saturday, April 7, with periods of heavy rain occurring around 3:30 am, 6:00 am, 9 am, and 1 pm. Prior to the start of sampling, 0.63 inches of rain was recorded (2:25 am to noon), and an additional 0.13 inches fell during the sample collection period (noon to 4 pm). After sampling ended, another 0.19 inches of rain was recorded during the remainder of the 24-hour storm period, for a total of 0.95 inches.</p>

Criteria	Actuals / Sampling Notes
<p>Dam discharge rate – Storm event with significant dam release (> 2,000 cfs).</p>	<p>Successfully targeted storm event with > 0.5 inches of rain with significant dam release. Although the release rate during the sampling period (approximately 1,930 cfs) was slightly below the threshold of >2,000 cfs in the QAPP, this level was sufficiently close to the targeted level to represent a significant dam release. The black box indicates approximate sampling window (noon - 4pm on Saturday, April 7).</p> <p style="text-align: center;">USGS 12105900 GREEN RIVER BELOW HOWARD A HANSON DAM, WA</p>  <p style="text-align: center;">---- Provisional Data Subject to Revision ----</p>
<p>Tides and Sample Timing – As described in the QAPP, no requirement exists for the timing of sample collection around tides during storm events. This information is provided for informational purposes.</p>	 <p style="text-align: right;">NOAA/NOS/Center for Operational Oceanographic Products and Services</p>
<p>Duwamish flow conditions – Although not a criteria for sampling, the flow rates for the Green/Duwamish River were checked to assess river flow during this time period. This information is provided for informational purposes.</p>	<p style="text-align: center;">USGS 12113000 GREEN RIVER NEAR AUBURN, WA</p>  <p style="text-align: center;">---- Provisional Data Subject to Revision ----</p> <p>Note – black box indicates approximate sampling window (noon – 4p)</p>

Grab collection times were as follows (overall sampling window from approximately noon to 4 pm on Saturday, April 7):

Location	Sampling Depth ^a	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface ^b	1210	9.6	1309	8.6	1412	8.5	1510	8.6
	near-bottom	1236	9.8	1335	8.5	1435	8.5	1535	8.4
SW2	near-surface	1210	7.2	1341	7.6	1447	7.5	1544	7.6
	near-bottom	1242	7.2	1303	7.8	1403	7.9	1508	7.4
SW3	mid-depth	1255	6.3	1350	7.1	1505	6.4	1550	5.9

Dry Baseflow Sampling Event (DB2) – July 30, 2018

Criteria	Actuals
Target Precipitation – 3-day antecedent period without measurable rainfall	No measurable precipitation was recorded during the 3-day antecedent period (the last recorded precipitation occurred on July 1, 2018).
Dam discharge rate – Dry-season average flow conditions (e.g., 200-600 cfs)	Successfully targeted dry season average conditions (e.g., 200-600 cfs). The dam release rate was between 260 and 270 cfs during the sample collection period (approximately 5:30 am to 9 am). <div style="text-align: center;"> <p>USGS 12105900 GREEN RIVER BELOW HOWARD A HANSON DAM, WA</p> <p>Discharge, cubic feet per second</p> <p>Jul 26 2018 Jul 27 2018 Jul 28 2018 Jul 29 2018 Jul 30 2018</p> <p>---- Provisional Data Subject to Revision ----</p> <p>△ Median daily statistic (57 years) — Discharge</p> </div>
Tides and Sample Timing – Sample collection should be approximately centered on the high tide.	Samples were collected on July 30, 2018, from approximately 5:30 am to 9 am, around the high tide at 6:43 am (sample collection started as early as possible in daylight hours). <div style="text-align: center;"> <p>Height in feet (MLLW)</p> <p>12:00 AM 03:00 AM 06:00 AM 09:00 AM 12:00 PM 03:00 PM 06:00 PM</p> <p>7/30 7/30 7/30 7/30 7/30 7/30 7/30</p> <p>NOAA/NOS/Center for Operational Ocean</p> </div>
Tide Type – Spring vs. neap	Samples were collected during a spring tide period (DB1 samples were collected during a neap tide).

Grab collection times were as follows (overall sampling window from 5:30 am to 9 am on July 30):

Location	Sampling Depth ^a	Grab 1		Grab 2		Grab 3		Grab 4	
		Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)	Time	Bottom Depth (m)
SW1	near-surface ^b	0615	13.4	0707	13.3	0805	12.9	0905	12.5
	near-bottom	0600	13.0	0655	13.1	0753	13.1	0852	12.8
SW2	near-surface	0600	11.4	0655	10.2	0800	9.8	0859	9.5
	near-bottom	0542	11.5	0642	10.3	0741	9.8	0842	9.5
SW3	mid-depth	0610	4.5	0705	4.4	0805	4.5	0900	4.1