

**4. Article Two, B.5- Water Quality Monitoring (“WQM”) Plan – Report on whether any of the semi-annual (or annual) WQM required under Article Two, B.5, was conducted during the quarter, and if so, in which sewer basins, and report the results of that monitoring (both BST and fecal coliform) for each such sewer basin.**

The 2015 annual round of water quality monitoring was conducted on March 19, 2015. All 26 of the sewer basins were sampled (semi-annual and annual). Human source fecal bacteria were identified by library-based Polymerase Chain Reaction (PCR) testing in one or more samples from thirteen sewer basins. Using an independent verification test, discussed below, human sources were confirmed in six of these basins.

As part of continuing re-evaluation of the Water Quality Monitoring Plan and of the methodologies used, the Virginia Tech laboratory that provides the bacterial source tracking (BST) testing services now conducts a verification test for human bacterial sources using a library-independent analytical method (Human Bacteroides HF183) on all samples. These results of that verification are presented below.

The 2015 semi-annual round of water quality sampling is planned for September, and results will be reported in the Fourth Quarter of 2015.

**Basins Subject to Semi-Annual Monitoring and Reporting Requirements:**

<b>a. Broad Creek-</b>	<b>BST Results:</b>	<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
BRC001 – downstream (Henson Creek)	Human Bacteroides HF183: Too few bacteria for HF183 (Too few bacteria for HF183) BOX-PCR Source Determination: Too few bacteria for BOX-PCR (Too few bacteria for BOX-PCR)	<10 (<10)

BRC002 – upstream (Henson Creek)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 3%</b> Avian – 37% Canine – 15% Deer – 9% Horse – 0% Misc. Wildlife – 20% Non-human Unknown – 16%	375
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Note: Values in parentheses for station BRC001 are for field duplicate sample.

**b. Cabin John- Fecal Bacteria Results:**  
**BST Results:** (Enterococcus CFU/100ml)

CBJ001 – downstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
CBJ002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 2%</b> Avian – 35% Canine – 5% Deer – 15% Horse – 0% Misc. Wildlife – 31% Non-human Unknown – 12%	23

**c. Horsepen- Fecal Bacteria Results:**  
**BST Results:** (Enterococcus CFU/100ml)

HSP001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 2%</b> Avian – 31% Canine – 6% Deer – 10% Horse – 8% Misc. Wildlife – 19% Non-human Unknown – 24%	45
HSP002 – upstream	Human Bacteroides HF183: <b>Negative</b> <b>(Negative)</b> BOX-PCR Source Determination: <b>Human – 3 (5)%</b> Avian – 28 (29)% Canine – 9 (6)% Deer – 7 (8)%	43 (47)

	Horse – 13 (12)% Misc. Wildlife – 24 (23)% Non-human Unknown – 16 (17)%	
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Note: Values in parentheses for station HSP002 are for field duplicate sample.

**d. Indian Creek- Fecal Bacteria Results:**  
**BST Results:** (*Enterococcus* CFU/100ml)

INC001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 5%</b> Avian – 29% Canine – 8% Deer – 8% Horse – 9% Misc. Wildlife – 23% Non-human Unknown – 18%	43
INC002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 7%</b> Avian – 25% Canine – 6% Deer – 6% Horse – 10% Misc. Wildlife – 22% Non-human Unknown – 24%	40

**e. Little Falls- Fecal Bacteria Results:**  
**BST Results:** (*Enterococcus* CFU/100ml)

LFS001 – downstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
LFS002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

<b>f. Lower Anacostia-</b>		<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
<b>BST Results:</b>		
ANA001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 7%</b> Avian – 38% Canine – 14% Deer – 0% Horse – 0% Misc. Wildlife – 22% Non-human Unknown – 19%	363
ANA002 – upstream	Human Bacteroides HF183: <b>Positive (Positive)</b> BOX-PCR Source Determination: <b>Human – 9 (8)%</b> Avian – 41 (42)% Canine – 16 (14)% Deer – 0 (0)% Horse – 0 (0)% Misc. Wildlife – 21 (21)% Non-human Unknown – 13 (15)%	410 (475)

Note: Values in parentheses for station ANA002 are for field duplicate sample.

<b>g. Lower Beaverdam Creek-</b>		<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
<b>BST Results:</b>		
LBD001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 16%</b> Avian – 25% Canine – 6% Deer – 9% Horse – 0% Misc. Wildlife – 28% Non-human Unknown – 16%	140
LBD002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 11%</b> Avian – 22% Canine – 0% Deer – 16% Horse – 0% Misc. Wildlife – 26% Non-human Unknown – 25%	48

<b>h. Muddy Branch-</b>	<b>BST Results:</b>	<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
MDB001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 28% Canine – 6% Deer – 15% Horse – 0% Misc. Wildlife – 31% Non-human Unknown – 20%	33
MDB002 – upstream	Human Bacteroides HF183: <b>Negative (Negative)</b> BOX-PCR Source Determination: <b>Human – 2 (2)%</b> Avian – 37 (33)% Canine – 3 (4)% Deer – 6 (6)% Horse – 0 (0)% Misc. Wildlife – 25 (27)% Non-human Unknown – 27 (28)%	120 (118)

Note: Values in parentheses for station MDB002 are for field duplicate sample.

<b>i. Northeast Branch-</b>	<b>BST Results:</b>	<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
NEB001 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
NEB002 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 13%</b> Avian – 27% Canine – 7% Deer – 7% Horse – 0% Misc. Wildlife – 22% Non-human Unknown – 24%	610

<b>j. Northwest Branch-</b>	<b>BST Results:</b>	<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
NWA001 – downstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

NWA002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
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**k. Oxon Run- Fecal Bacteria Results:**  
**BST Results:** (Enterococcus CFU/100ml)

OXN001 – downstream (Oxon Run)	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
OXN002 – upstream (Watts Branch, tributary to Anacostia River)	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

**l. Paint Branch- Fecal Bacteria Results:**  
**BST Results:** (Enterococcus CFU/100ml)

PNT001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 33% Canine – 12% Deer – 14% Horse – 0% Misc. Wildlife – 26% Non-human Unknown – 15%	20
PNT002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

**m. Parkway- Fecal Bacteria Results:**  
**BST Results:** (Enterococcus CFU/100ml)

PKY001 – downstream (Bear Branch)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 2%</b> Avian – 34% Canine – 12% Deer – 16% Horse – 0% Misc. Wildlife – 26% Non-human Unknown – 10%	20
PKY002 – upstream (Walker Branch)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination:	17

	<b>Human – 0%</b> Avian – 32% Canine – 10% Deer – 16% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 15%	
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**n. Piscataway-** **Fecal Bacteria Results:**  
(*Enterococcus* CFU/100ml)

	<b>BST Results:</b>	
PSW001 – downstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
PSW002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

**o. Rock Creek-** **Fecal Bacteria Results:**  
(*Enterococcus* CFU/100ml)

	<b>BST Results:</b>	
RKC001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 15%</b> Avian – 31% Canine – 8% Deer – 12% Horse – 0% Misc. Wildlife – 23% Non-human Unknown – 11%	123
RKC002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 8%</b> Avian – 29% Canine – 5% Deer – 12% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 25%	128

**p. Seneca Creek-** **Fecal Bacteria Results:**  
(*Enterococcus* CFU/100ml)

	<b>BST Results:</b>	
SNC001 – downstream (Seneca Creek)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 5%</b>	40

	Avian – 31% Canine – 15% Deer – 7% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 21%	
SNC002 – upstream (Dry Seneca Creek)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 3%</b> Avian – 33% Canine – 12% Deer – 8% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 17%	40

**q. Sligo Creek-****Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

SLC001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 12%</b> Avian – 28% Canine – 9% Deer – 14% Horse – 0% Misc. Wildlife – 25% Non-human Unknown – 12%	45
SLC002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

**r. Upper Beaverdam Creek-****Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

UBD001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 22%</b> Avian – 22% Canine – 6% Deer – 15% Horse – 0% Misc. Wildlife – 24% Non-human Unknown – 11%	340
UBD002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination:	27



	<b>Human – 10%</b> Avian – 34% Canine – 7% Deer – 5% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 17%	
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**s. Watts Branch- Fecal Bacteria Results:**  
**BST Results:** (*Enterococcus* CFU/100ml)

WTB001 – downstream (Watts Branch)	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
WTB002 – upstream (Sandy Branch)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 33% Canine – 6% Deer – 12% Horse – 0% Misc. Wildlife – 22% Non-human Unknown – 27%	23

**t. Western Branch- Fecal Bacteria Results:**  
**BST Results:** (*Enterococcus* CFU/100ml)

WNB001 – downstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
WNB002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

**Basins Subject to Annual Monitoring and Reporting Requirements-**

**BST Results:** **Fecal Bacteria Results:**  
(*Enterococcus* CFU/100ml)

**a. Dulles Interceptor-**

DSI001	Human Bacteroides HF183: Too few bacteria for HF183 (Too few bacteria for HF183) BOX-PCR Source Determination:	<10 (<10)
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	Too few bacteria for BOX-PCR (Too few bacteria for BOX-PCR)	
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Note: Values in parentheses for station DSI001 are for field duplicate sample.

**b. Mattawoman-**

MTW001	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
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**c. Monocacy-**

MCY001	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
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**d. Patuxent Center-**

PTC001 (Mill Branch)	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
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**e. Patuxent North-**

PTN001 (Hawlings River)	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
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**f. Rock Run-**

RCM001	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
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