

**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 2014 second semi-annual round of water quality monitoring was conducted on September 17, 2014. Twenty of the twenty-six sewer basins were sampled. Human source fecal bacteria were identified by library-based Polymerase Chain Reaction (PCR) testing in one or more samples from seventeen sewer basins. Using an independent verification test, discussed below, human sources were confirmed in ten 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 annual round of water quality sampling is planned for March, and results will be reported in the Second Quarter of 2015.

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

**a. Broad Creek-**

**Fecal Bacteria Results:**

**BST Results:**

*(Enterococcus CFU/100ml)*

<p>BRC001 – downstream (Henson Creek)</p>	<p>Human Bacteroides HF183: <b>Negative</b>  BOX-PCR Source Determination:  <b>Human – 1%</b>  Avian – 40%  Canine – 20%  Deer – 12%  Horse – 0%  Misc. Wildlife – 18%</p>	<p>142</p>
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	Non-human Unknown – 9%	
BRC002 – upstream (Henson Creek)	Human Bacteroides HF183: <b>Negative (Negative)</b> BOX-PCR Source Determination: <b>Human – 0 (0)%</b> Avian – 38 (39)% Canine – 12 (12)% Deer – 12 (14)% Horse – 0 (0)% Misc. Wildlife – 28 (27)% Non-human Unknown – 10 (8)%	25 (24)

Note: Values in parentheses for station BRC002 are for field duplicate sample.

**b. Cabin John-**

**Fecal Bacteria Results:**

**BST Results:**

(*Enterococcus* CFU/100ml)

CBJ001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 9%</b> Avian – 44% Canine – 7% Deer – 3% Horse – 0% Misc. Wildlife – 20% Non-human Unknown – 17%	93
CBJ002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

**c. Horsepen-**

**Fecal Bacteria Results:**

**BST Results:**

(*Enterococcus* CFU/100ml)

HSP001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 10%</b> Avian – 32% Canine – 10% Deer – 6% Horse – 20% Misc. Wildlife – 12% Non-human Unknown – 10%	181
HSP002 – upstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 2%</b> Avian – 36% Canine – 9%	75

	Deer – 8% Horse – 19% Misc. Wildlife – 16% Non-human Unknown – 10%	
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**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 – 0%</b> Avian – 35% Canine – 5% Deer – 6% Horse – 24% Misc. Wildlife – 17% Non-human Unknown – 13%	28
INC002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

**e. Little Falls-**

**Fecal Bacteria Results:**

**BST Results:**

(*Enterococcus* CFU/100ml)

LFS001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 19%</b> Avian – 32% Canine – 9% Deer – 12% Horse – 0% Misc. Wildlife – 19% Non-human Unknown – 9%	173
LFS002 – upstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 8%</b> Avian – 37% Canine – 8% Deer – 15% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 11%	56

<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 – 6%</b> Avian – 40% Canine – 12% Deer – 10% Horse – 0% Misc. Wildlife – 20% Non-human Unknown – 12%	78
ANA002 – upstream	Human Bacteroides HF183: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10

<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: Too few bacteria for HF183 BOX-PCR Source Determination: Too few bacteria for BOX-PCR	<10
LBD002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 7%</b> Avian – 34% Canine – 15% Deer – 7% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 10%	81

<b>h. Muddy Branch-</b>		<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
	<b>BST Results:</b>	
MDB001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 41% Canine – 15% Deer – 11% Horse – 0% Misc. Wildlife – 24% Non-human Unknown – 9%	32
MDB002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 8%</b>	127

	Avian – 38% Canine – 12% Deer – 12% Horse – 0% Misc. Wildlife – 18% Non-human Unknown – 12%	
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**i. Northeast Branch-**

**Fecal Bacteria Results:**

**BST Results:**

(*Enterococcus* CFU/100ml)

NEB001 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 6%</b> Avian – 36% Canine – 9% Deer – 12% Horse – 0% Misc. Wildlife – 25% Non-human Unknown – 12%	184
NEB002 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 8%</b> Avian – 35% Canine – 10% Deer – 9% Horse – 0% Misc. Wildlife – 22% Non-human Unknown – 16%	215

**j. Northwest Branch-**

**Fecal Bacteria Results:**

**BST Results:**

(*Enterococcus* CFU/100ml)

NWA001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 39% Canine – 7% Deer – 6% Horse – 0% Misc. Wildlife – 24% Non-human Unknown – 24%	62
NWA002 – upstream	Human Bacteroides HF183: <b>Negative</b> ( <b>Negative</b> ) BOX-PCR Source Determination: <b>Human – 9 (9)%</b> Avian – 40 (41)% Canine – 9 (9)% Deer – 2 (3)%	212 (220)

	Horse – 0 (0)% Misc. Wildlife – 17 (16)% Non-human Unknown – 23 (22)%	
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Note: Values in parentheses for station NWA002 are for field duplicate sample.

**k. Oxon Run-**

**Fecal Bacteria Results:**

**BST Results:**

(*Enterococcus* CFU/100ml)

OXN001 – downstream (Oxon Run)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 6%</b> Avian – 33% Canine – 11% Deer – 10% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 19%	176
OXN002 – upstream (Watts Branch, tributary to Anacostia River)	Human Bacteroides HF183: <b>Positive (Positive)</b> BOX-PCR Source Determination: <b>Human – 25 (24)%</b> Avian – 28 (28)% Canine – 3 (4)% Deer – 8 (8)% Horse – 0 (0)% Misc. Wildlife – 24 (25)% Non-human Unknown – 12 (11)%	782 (763)

Note: Values in parentheses for station OXN002 are for field duplicate sample.

**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 – 29% Canine – 13% Deer – 8% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 23%	208
PNT002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 30% Canine – 15% Deer – 6% Horse – 0%	231

	Misc. Wildlife – 28% Non-human Unknown – 21%	
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**m. Parkway-****Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

PKY001 – downstream (Bear Branch)	Human Bacteroides HF183: <b>Negative (Negative)</b> BOX-PCR Source Determination: <b>Human – 5 (6)%</b> Avian – 29 (30)% Canine – 9 (8)% Deer – 7 (7)% Horse – 0 (0)% Misc. Wildlife – 28 (29)% Non-human Unknown – 22 (20)%	110 (117)
PKY002 – upstream (Walker Branch)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 33% Canine – 13% Deer – 6% Horse – 0% Misc. Wildlife – 25% Non-human Unknown – 23%	43

Note: Values in parentheses for station PKY001 are for field duplicate sample.

**n. Piscataway-****Fecal Bacteria Results:****BST Results:***(Enterococcus CFU/100ml)*

PSW001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 34% Canine – 12% Deer – 14% Horse – 0% Misc. Wildlife – 20% Non-human Unknown – 20%	294
PSW002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 29% Canine – 14% Deer – 9% Horse – 0% Misc. Wildlife – 26% Non-human Unknown – 22%	483

<b>o. Rock Creek-</b>		<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
	<b>BST Results:</b>	
RKC001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 8%</b> Avian – 31% Canine – 12% Deer – 7% Horse – 0% Misc. Wildlife – 24% Non-human Unknown – 18%	110
RKC002 – upstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 14%</b> Avian – 25% Canine – 14% Deer – 13% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 13%	255

<b>p. Seneca Creek-</b>		<b>Fecal Bacteria Results:</b> ( <i>Enterococcus</i> CFU/100ml)
	<b>BST Results:</b>	
SNC001 – downstream (Seneca Creek)	Human Bacteroides HF183: <b>Positive (Positive)</b> BOX-PCR Source Determination: <b>Human – 19 (19)%</b> Avian – 33 (25)% Canine – 7 (6)% Deer – 3 (3)% Horse – 0 (0)% Misc. Wildlife – 22 (25)% Non-human Unknown – 16 (22)%	672 (661)
SNC002 – upstream (Dry Seneca Creek)	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 13%</b> Avian – 39% Canine – 8% Deer – 4% Horse – 0% Misc. Wildlife – 14% Non-human Unknown – 22%	441

Note: Values in parentheses for station SNC001 are for field duplicate sample.



q. Sligo Creek-	BST Results:	Fecal Bacteria Results: ( <i>Enterococcus</i> CFU/100ml)
SLC001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 36% Canine – 9% Deer – 6% Horse – 0% Misc. Wildlife – 29% Non-human Unknown – 20%	71
SLC002 – upstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 11%</b> Avian – 26% Canine – 5% Deer – 7% Horse – 0% Misc. Wildlife – 25% Non-human Unknown – 26%	433

r. Upper Beaverdam Creek-	BST Results:	Fecal Bacteria Results: ( <i>Enterococcus</i> CFU/100ml)
UBD001 – downstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 7%</b> Avian – 38% Canine – 10% Deer – 8% Horse – 0% Misc. Wildlife – 23% Non-human Unknown – 14%	277
UBD002 – upstream	Human Bacteroides HF183: <b>Positive</b> BOX-PCR Source Determination: <b>Human – 9%</b> Avian – 36% Canine – 0% Deer – 6% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 22%	338

s. Watts Branch-	BST Results:	Fecal Bacteria Results: ( <i>Enterococcus</i> CFU/100ml)
WTB001 – downstream (Watts Branch)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 5%</b> Avian – 41% Canine – 9% Deer – 8% Horse – 0% Misc. Wildlife – 21% Non-human Unknown – 16%	137
WTB002 – upstream (Sandy Branch)	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 28% Canine – 11% Deer – 9% Horse – 0% Misc. Wildlife – 26% Non-human Unknown – 26%	91

t. Western Branch-	BST Results:	Fecal Bacteria Results: ( <i>Enterococcus</i> CFU/100ml)
WNB001 – downstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 4%</b> Avian – 26% Canine – 11% Deer – 7% Horse – 0% Misc. Wildlife – 27% Non-human Unknown – 25%	105
WNB002 – upstream	Human Bacteroides HF183: <b>Negative</b> BOX-PCR Source Determination: <b>Human – 0%</b> Avian – 33% Canine – 6% Deer – 12% Horse – 0% Misc. Wildlife – 28% Non-human Unknown – 21%	62

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

**BST Results:**

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

- a. **Dulles Interceptor-**
- b. **Mattawoman-**
- c. **Monocacy-**
- d. **Patuxent Center-**
- e. **Patuxent North-**
- f. **Rock Run-**