



BIOLOGICAL MONITORING REPORT #1

Pre-construction Monitoring

NORTHERN VIRGINIA STREAM RESTORATION BANK

Colvin Run Watershed
(±31,000 LINEAR FEET)

FAIRFAX COUNTY, VIRGINIA



Prepared For:

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WSSI Project #20010D

November 6, 2008

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November 6, 2008

I. Executive Summary

As set forth in the “Northern Virginia Stream Restoration Bank Banking Instrument” (Banking Instrument), approximately 31,000 linear feet of streams and drainage features within the Colvin Run Watershed will be stabilized and restored. This stream restoration project should result in a direct improvement in in-stream habitat and an indirect improvement in water quality.

Wetland Studies and Solutions, Inc. (WSSI) conducted pre-construction biological stream assessments along the Colvin Run Watershed portion of the Northern Virginia Stream Restoration Bank (NVS RB) pursuant to the maintenance and monitoring requirements defined in the NVSRB Banking Instrument (Section VI.B.2.i). The purpose of this pre-construction monitoring is to determine the baseline conditions of the streams within the Colvin Run Watershed portion of the NVSRB, against which future biological monitoring in the study area can be compared.

A total of ten permanent monitoring reaches were established along nine representative samplable streams within the Colvin Run Watershed portion of the NVSRB. A biological field reconnaissance (the Environmental Protection Agency’s BioRecon) combined with observations of stream flow were used to establish the location of these permanent monitoring reaches. Once established, biological stream monitoring was conducted along these reaches using benthic macroinvertebrate and habitat data. Benthic macroinvertebrate data was used to calculate a Stream Condition Index for Virginia Non-coastal Streams (VA-SCI) and habitat data was used to calculate the percentage of best possible habitat for each reach.

Our baseline habitat results indicate that habitat of the streams within the Colvin Run Watershed portion of the NVSRB is “Poor” to “Fair”, with one stream reach scoring as “Good”. Habitat assessment scores ranged from 157 (out of 200) for the “Good” stream to 86 (out of 200) for the lowest “Poor” stream. The low habitat assessment scores are due to the lack of epifaunal substrate/available cover for stream macrofauna, highly embedded epifaunal substrate, over-widened stream channels, bank instability, and lack of vegetation protection along the stream banks.

Baseline benthic macroinvertebrate results indicate that streams within the Colvin Run watershed portion of the NVSRB are in “Severe Stress”, with VA-SCI scores below 40 (out of 100) for all streams assessed. The low VA-SCI scores are likely due to several confounding abiotic factors, including highly impervious land cover within the watershed, high nutrient, toxicant and sediment input from adjacent land use, channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, and lack of epifaunal substrate/available cover.

II. Introduction

As set forth in the “Northern Virginia Stream Restoration Bank Banking Instrument” (Banking Instrument), dated February 17, 2006 and prepared by Wetland Studies and Solutions,

Inc. (WSSI), Northern Virginia Stream Restoration, L.C. will restore approximately 14 miles of streams and upland buffers, within portions of the Snakeden Branch, Colvin Run, and The Glade watersheds in the town of Reston, Virginia. These restoration activities should result in a direct improvement in in-stream habitat and an indirect improvement in water quality. As required by Section VI.B.2.i of the Banking Instrument, biological monitoring will be conducted within the restored portion of the streams within the Snakeden Branch, Colvin Run, and The Glade watersheds.

This pre-construction monitoring report characterizes the baseline conditions of the streams within the Colvin Run Watershed portion of the NVSRB using benthic macroinvertebrate and habitat data. With this data, and data from subsequent monitoring reports, we propose to determine the effect of stream restoration on the condition of streams within the Colvin Run Watershed portion of the NVSRB¹, as well as aid in the development of numerical success criteria for non-coastal stream restoration projects in Virginia.

III. Project Area

The study area includes approximately 31,000 linear feet of stream along Colvin Run and several unnamed tributaries of Colvin Run, as well as the adjacent riparian corridor. The study area is located between the Dulles Access Road (Route 267) and Harry Bird Highway (Route 7) to the west of Lake Fairfax Park, in Northern Fairfax County, Virginia. Exhibit 1 is a vicinity map that depicts the approximate location of the study area.

The study area is covered mostly by mixed-deciduous forest. Colvin Run flows in a northeasterly direction through the southern portion of the study area. The study area is gently to steeply sloping. The topography can be seen in the excerpt from the Vienna, Virginia-Maryland 1994 USGS topographical quadrangle map included as Exhibit 2, as well as in the background topography on the Biological Stream Assessment Reconnaissance and Biological Monitoring Maps (Exhibits 3A and 3B, respectively).

The boundaries of jurisdictional wetlands and other waters of the U.S. located within the study area were delineated and survey-located by WSSI as described in a report entitled "Waters of the U.S. Delineation, Northern Virginia Stream Restoration Bank, A Portion of the Colvin Run Watershed (\pm 116 acres)". WSSI has received a confirmation letter (# 2007-2482) from the U.S. Army Corps of Engineers dated May 31, 2007, approving the delineation.

IV. Overall Methodology

Per maintenance and monitoring requirements defined in the Banking Instrument (Section VI.B.2.i), biological stream assessment reaches are to be established for every 2000 linear feet of stream restoration along samplable streams at the NVSRB. Once established, these reaches are to be monitored prior to stream restoration, then in years 1, 5, and 10. The following methods are to be employed:

- Biological Reconnaissance (BioRecon), following guidance established in the Environmental Protection Agency's (EPA) "Rapid Bioassessment Protocols for Use in

¹ Note that monitoring reports for Snakeden Branch and The Glade watershed portions of the NVSRB will be provided under separate cover.

Streams and Wadable Rivers” (EPA’s Rapid Bioassessment Protocols (RBP); Barbour et al. 1999)².

- Biological stream assessment for Calculating the Stream Condition Index for Virginia Non-coastal Streams (VA-SCI), following guidance established in “A Stream Condition Index for Virginia Non-Coastal Streams” (Tetra Tech 2003) and “Using Probabilistic Monitoring Data to Validate the Non-Coastal Virginia Stream Condition Index” (DEQ 2006a)³.

V. Biological Stream Assessment Reconnaissance

Biological Stream Assessment Reconnaissance Methodology The biological stream assessment reconnaissance consisted of three components: 1) a pedestrian reconnaissance; 2) a Biological Reconnaissance (BioRecon) (a.k.a. Problem Identification Survey); and 3) permanent biological monitoring stream reach selection. The pedestrian reconnaissance was used to determine which streams within the study area contain enough flowing water to sample for benthic macroinvertebrates. The BioRecon, established in the RBP for benthic macroinvertebrates (Barbour et al. 1999), is a rapid assessment using benthic macroinvertebrates and was used to determine the general condition of the streams within the study area⁴. Combined, both the pedestrian reconnaissance and BioRecon helped prioritize the placement of permanent biological monitoring reaches along representative stream reaches within the study area.

The biological stream assessment reconnaissance was conducted by WSSI Environmental Scientists Amy Connelly, WPIT, PWD⁵ and Sean D. Sipple, PWS, CT⁶ on February 16 and April 6, 2007. During this reconnaissance, WSSI traversed all jurisdictional streams along the entire Colvin Run watershed study area to determine the locations of potential permanent biological monitoring stations. All streams within the study area were characterized as having flowing water, discontinuous flow, or lacking flow altogether. Streams that contained flowing water during the February and April 2007 reconnaissance fieldwork were noted as potential streams for permanent biological monitoring stations and BioRecon macroinvertebrate samples were taken to determine their general biotic condition. Streams that lacked flowing water during the reconnaissance fieldwork were eliminated as candidate streams for establishing permanent biological monitoring stations. Streams that contained discontinuous flow were to be re-

² This method was used to aid in the selection of permanent monitoring reaches and is not required in subsequent monitoring years.

³ This method will be used in all subsequent monitoring years and is accompanied by a habitat assessment, following guidance established in the Virginia Department of Environmental Quality’s (DEQ) Standard Operating Procedures for stream habitat assessment (SOPs, DEQ 2006b) and the RBP for habitat (Barbour et al. 1999).

⁴ The results of WSSI’s BioRecon for the Snakeden Branch Watershed portion of the NVSRB indicated that the streams are in poor condition, and the BioRecon method may not be useful in highly developed watersheds. Therefore, since the Colvin Run Watershed is also highly developed permanent biological sampling reaches were chosen without using data from the BioRecon. However, a few BioRecon samples were taken prior to selecting permanent monitoring stations within the Colvin Run watershed to determine whether this watershed indeed appears to be impaired or there are substantial differences in the biology within the streams.

⁵ Wetland Professional in Training, Society of Wetlands Scientists Certification Program, Inc.; VA Certified Professional Wetland Delineator #3402-000082,

⁶ Professional Wetland Scientist #00001730, Society of Wetlands Scientists Certification Program, Inc.; North American Benthological Society (NABS) Certified Level 2 Taxonomist: EPT Taxa (Ephemeroptera, Plecoptera, Trichoptera).

evaluated during the time of the pre-construction monitoring sampling to determine if they contain enough flowing water to sample. Photographs of BioRecon sampling reaches and representative non-samplable streams are provided in Exhibit 4A.

WSSI used the BioRecon method to assess four stream reaches⁷ along four candidate streams that contained flowing water during the February and April 2007 field work (Exhibit 4A, Photos #1 through #4). The approximate locations of these stream reaches are depicted on Exhibit 3A. Sampling reaches were 300 linear feet, as recommended in the RBP. In accordance with the BioRecon, an area of 4 square feet of best-available habitat was sampled in each reach using a D-Framed Net. Multiple habitat types were sampled including cobble/gravel, snags/leafpacks and under-cut banks. Benthic macroinvertebrate field samples were collected, processed, and identified according to guidance established in the RBP.

Benthic macroinvertebrate samples were sorted and identified to the lowest taxonomic level possible (mostly Genus-level) at WSSI in the Science Laboratory. Due to taxonomic difficulty, members of the dipteran family Chironomidae were identified to tribe, and aquatic annelids (segmented worms) were identified to family. Each individual found in a sample was recorded and enumerated on a WSSI Benthic Macroinvertebrate I.D. and Enumeration Bench Sheet, which is included in Exhibit 5A for each individual reach.

Benthic macroinvertebrate data were used to calculate 3 biotic metrics, including Total Taxa Richness, Ephemeroptera, Plecoptera, and Trichoptera (EPT) Taxa Richness, and Percent Chironomidae + Oligochaeta. The individual metrics used are described as follows:

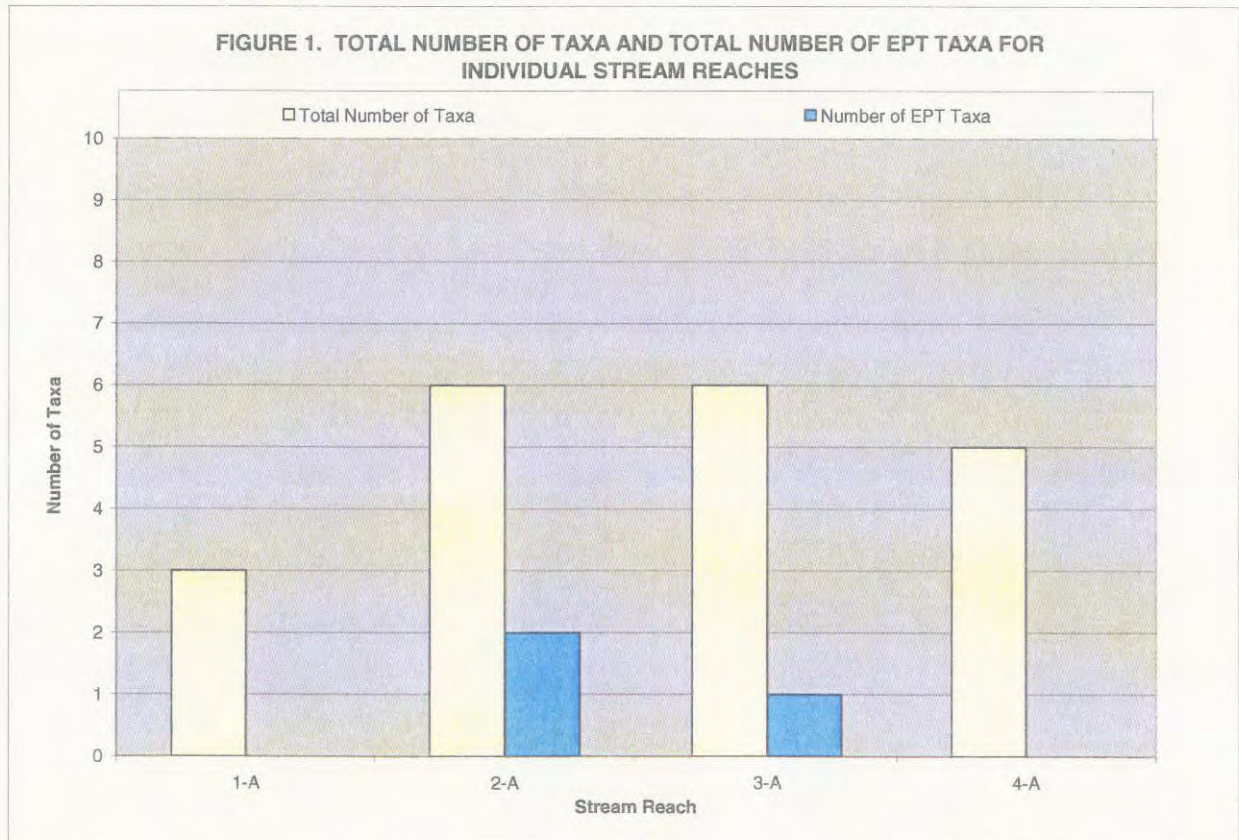
- *Total Taxa Richness.* Total Taxa Richness represents the total number of taxa in a sample. Total Taxa Richness is expected to be relatively high in undisturbed streams and is expected to decrease in response to environmental disturbance.
- *EPT Taxa Richness.* EPT Taxa Richness represents the number of taxa from the aquatic insect orders Ephemeroptera, Plecoptera, and Trichoptera. EPT taxa are generally very sensitive to pollution. Total EPT Taxa Richness is expected to be relatively high in undisturbed streams, and it is expected to decrease in response to environmental disturbance.
- *Percent Chironomidae + Oligochaeta.* The Percent Chironomidae + Oligochaeta represents the ratio of members of the aquatic insect family Chironomidae (non-biting midges) plus members of the aquatic annelid class Oligochaeta to the total number of individuals in a sample. Because both chironomids and oligochaetes are generally tolerant to pollution, Percent Chironomidae + Oligochaeta is expected to increase in response to environmental disturbance.

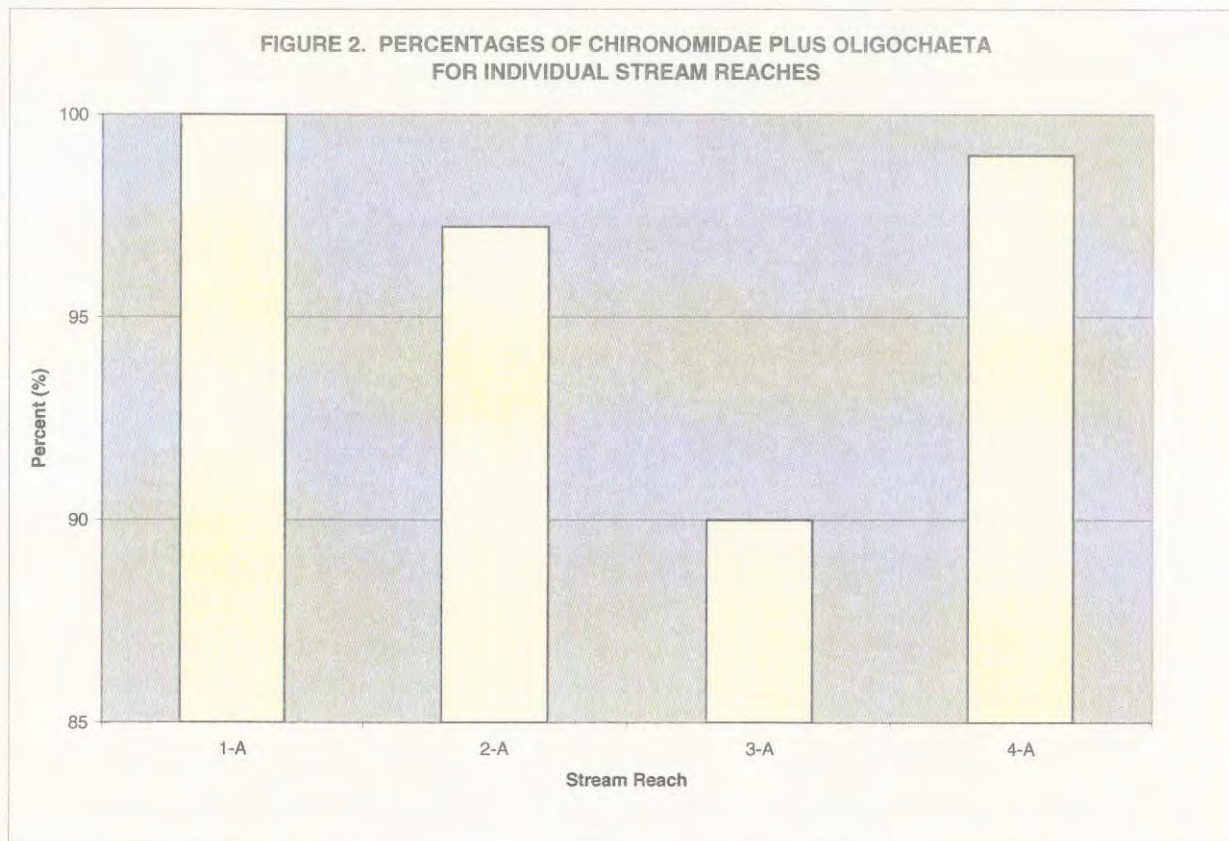
Biological Stream Assessment Reconnaissance Results and Discussion The results of the pedestrian reconnaissance field work indicated that only nine streams have enough flowing water to establish permanent biological monitoring stations. Some streams within the study area did not contain enough flowing water to sample (e.g., Exhibit 4, Photos #5 and #6). The streams that contained discontinuous flow during the February and April 2007 field work were re-evaluated during the biological monitoring field work and were determined unsuitable for permanent monitoring reaches due to lack of flowing water.

⁷ Note that for design purposes, Colvin Run has been divided into 16 manageable restoration reaches. BioRecon stream reach labels 1-A, 2-A, 3-A, and 4-A correspond with construction design stream reach labels 6, 10, 2, and 3A respectively.

Of the four stream reaches characterized with the BioRecon method, Stream Reaches 2-A and 3-A had the highest taxa richness, with six total taxa each (Table 1, Figure 1). The lowest taxa richness was observed at Stream Reach 1-A which contained only two taxa. EPT Taxa Richness was low at all four reaches (equaling zero at Reaches 1-A and 4-A), with only two total EPT taxa collected (*Hydropsyche* sp. and *Philopotamidae* sp.). Furthermore, one of the two EPT taxa observed was a member of the caddisfly Family Hydropsychidae, a caddisfly family indicative of degraded streams (Voshell 2002). Percent Chironomidae + Oligochaeta was high in all four stream reaches (Table 1, Figure 2). The BioRecon results showed low total taxa richness, low EPT taxa richness, and high Chironomidae and Oligochaeta percentages, indicating that most stream reaches within the study area are likely in poor to fair condition.

Reach	Total Individuals	Total Taxa Richness	EPT Taxa Richness	% Chironomidae + Oligochaeta
1-A	28	2	0	100
2-A	108	6	2	97
3-A	30	6	1	90
4-A	297	5	0	99





The results of the biotic metrics suggest that all four reaches are in relatively similar condition, with low total taxa and EPT taxa richness and a high percentage of Chironomidae + Oligochaeta. The low taxa richness suggests that these reaches provide a relatively poor substrate for colonization. The high Percent Chironomidae + Oligochaeta suggests that these reaches may also have lower water quality. These results are likely due to the highly developed nature of the Colvin Run Watershed.

Permanent Biological Monitoring Reach Selection The Banking Instrument defines the number of permanent biological monitoring reaches as the total length (in linear feet) of samplable restored stream divided by 2000. Of the approximately 31,000 linear feet of stream restoration within the Colvin Run Watershed portion of the NVSRB, approximately 15,400 linear feet is samplable for macroinvertebrates, thus eight permanent monitoring reaches were required to be established within the study area. However, WSSI established two additional permanent biological monitoring reaches (for a total of ten reaches) in anticipation of potential future modifications of the study area to ensure that the streams were adequately sampled. The approximate location (based on the surveyed location of nearby trees) of these ten reaches is depicted on Exhibit 3B⁸. Monitoring reaches were selected based on the field reconnaissance using the presence of flowing water and samplable habitat areas.

⁸ The locations of each of the 10 stream reaches were approximated on Exhibit 3B using survey located trees (which are numerically tagged), noted during the biological monitoring field work and depicted on Exhibit 3B.

VI. Biological Stream Monitoring

Biological Stream Monitoring Methodology The biological stream monitoring consisted of two components: 1) Stream habitat assessment and 2) benthic macroinvertebrate assessment. The habitat assessment field work was conducted using guidance established in the Virginia Department of Environmental Quality's (DEQ) standard operating procedures (SOP) for stream habitat assessment (SOPs; DEQ 2006b) and the EPA's RBP for habitat (Barbour et al. 1999). The benthic macroinvertebrate assessment field work was conducted using guidance established in the SOPs for multi-habitat benthic macroinvertebrate sampling (DEQ 2006b).

A total of ten permanent sampling reaches⁹ were selected based on the results of the Biological Stream Assessment Reconnaissance (Figure 3). As required by the SOPs, each reach is 300 linear feet. The approximate location of each reach is depicted on Exhibit 3B. Photographs of each reach are included on Exhibit 4B. Benthic macroinvertebrate sampling and habitat assessment field work was conducted by WSSI environmental scientists Amy Connelly, WPIT, PWD Sean D. Sipple, PWS, CT, Benjamin N. Rosner, PWS, PWD¹⁰, and Beth A. Clements on April 18 and 20, 2007.

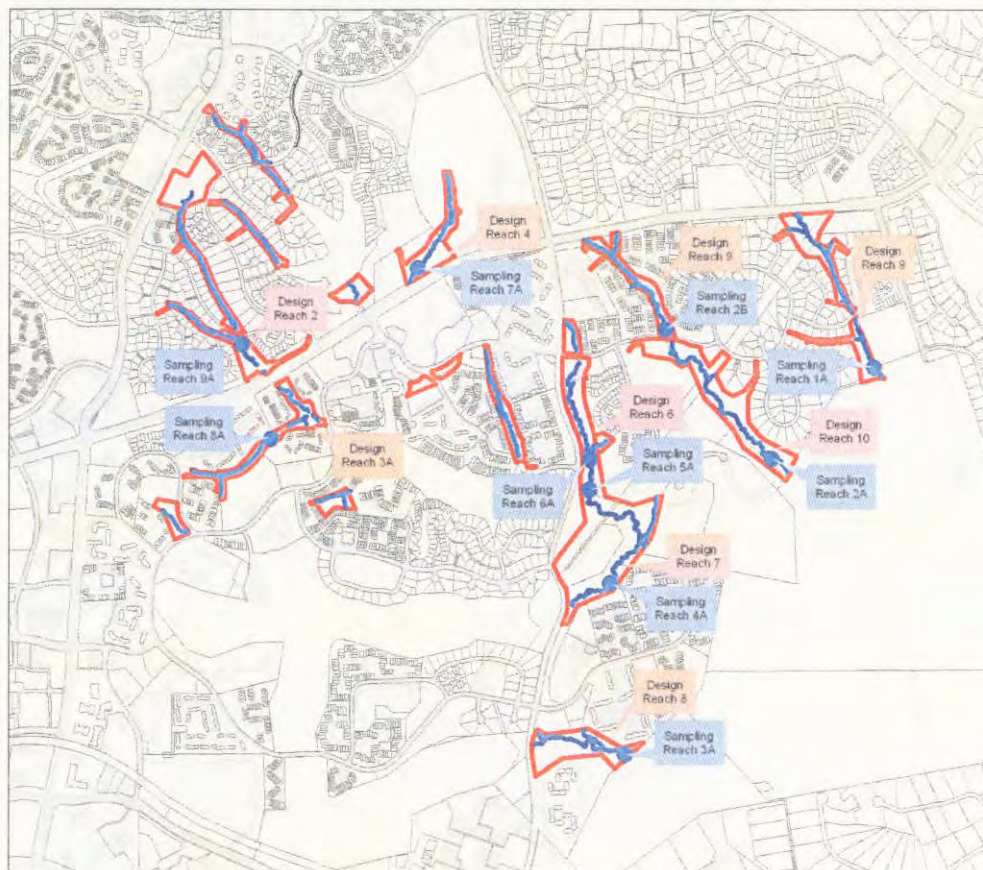


Figure 3. Stream Reach Locations and Corresponding Construction Reaches

⁹ Note that for design purposes, Colvin Run has been divided into 16 manageable restoration reaches. Monitoring stream reach labels 1-A, 2-A, 2-B, 3-A, 4-A, 5-A, 6-A, 7-A, 8-A, and 9-A correspond with construction design reach labels 12, 10, 9, 8, 7, 6, 6, 4, 3A, and 2 respectively.

¹⁰ Professional Wetland Scientist #00001766, Society of Wetlands Scientists Certification Program, Inc.; VA Certified Professional Wetland Delineator #3402-000080.

In accordance with the SOPs, habitat conditions were assessed by qualitatively rating ten habitat parameters, including Epifaunal Substrate/Available Cover, Pool Substrate Characterization, Pool Variability, Sediment Deposition, Channel Flow Status, Channel Alteration, Channel Sinuosity, Bank Stability, Vegetative Protection, and Riparian Vegetative Zone. The overall habitat quality of each reach was determined by calculating the percentage of the best possible score¹¹, where the best possible score for each reach equals 200. The following formula was used to determine the percentage of best possible score for each reach:

$$\text{Percentage of Best Possible Score} = (\text{Total Habitat Score}) / (200) * 100$$

Each reach was then assigned a narrative rating according to the calculated percentage of best possible score, where “Excellent” is >90, “Good” is 75-88, “Fair” is 60-73, and “Poor” is <58. WSSI Habitat Assessment Field Data Sheets (developed from the RBP Habitat Assessment Field Data Sheets) for each reach are included as [Exhibit 6](#).

To assess benthic macroinvertebrate condition, 60 linear feet of best-available habitat was sampled in each reach using a D-Framed Net. Habitat types sampled include cobble/gravel, snags/leafpacks, under-cut banks, root-wads, and submerged vegetation. Benthic field data was recorded on WSSI Benthic Macroinvertebrate Field Data Sheets (developed from the RBP Benthic Macroinvertebrate Field Data Sheets), which are included as [Exhibit 7](#).

Benthic macroinvertebrate samples were processed and subsampled by WSSI staff using guidance from the SOPs. Specifically, a fixed-count method was used, where one hundred twenty organisms were randomly picked from a gridded (numbered) tray and the organisms were identified to the family level (if possible) using a dissecting microscope. Each individual (containing a head) found in a sample was recorded and enumerated on a WSSI Benthic Macroinvertebrate I.D. and Enumeration Bench Sheet ([Exhibit 5B](#)).

Benthic macroinvertebrate data were analyzed by calculating the Stream Condition Index for Virginia Non-coastal Streams (VA-SCI), following guidance established in “A Stream Condition Index for Virginia Non-Coastal Streams” and “Using Probabilistic Monitoring Data to Validate the Non-Coastal Virginia Stream Condition Index”. The VA-SCI is a multi-metric Index of Biotic Integrity developed for the DEQ to assess Streams of the Commonwealth. The VA-SCI uses seven biotic metrics and one biotic index including Total Taxa, EPT Taxa, Percent Ephemeroptera, Percent Plecoptera + Trichoptera (Excluding Hydropsychidae), Percent Scrapers, Percent Chironomidae, Percent Top Two Dominant Taxa, and Hilsenhoff Biotic Index. The individual metrics and index used are defined and described as follows:

- **Total Taxa Richness.** Total Taxa Richness represents the total number of taxa in a sample. Total Taxa Richness is expected to be relatively high in undisturbed streams and is expected to decrease in response to environmental disturbance. Total Taxa Richness can range from 0-22 for the VA-SCI.
- **EPT Taxa Richness.** EPT Taxa Richness represents the number of taxa from the aquatic insect orders Ephemeroptera, Plecoptera, and Trichoptera. EPT taxa are generally very sensitive to pollution. Total EPT Taxa Richness is expected to be relatively high in undisturbed streams, and it is expected to decrease in response to environmental disturbance. EPT Taxa Richness can range from 0-11 for the VA-SCI.

¹¹ *The SOPs indicate that overall habitat quality is determined by calculating the percent similarity to a reference score. Since reference reaches were not available to assess, WSSI used the best possible score as the reference score.*

- **Percent Ephemeroptera.** The Percent Ephemeroptera represents the ratio of members of the aquatic insect order Ephemeroptera (mayflies) to the total number of individuals in a sample. Mayflies are generally very sensitive to pollution, thus Percent Ephemeroptera is expected to decrease in response to environmental disturbance. Percent Ephemeroptera can range from 0-61.3 for the VA-SCI.
- **Percent Plecoptera + Trichoptera (Excluding Hydropsychidae).** The Percent Plecoptera + Trichoptera (Excluding Hydropsychidae) represents the ratio of members of the aquatic insect orders Plecoptera (stoneflies) and Trichoptera (caddisflies) (excluding the those in the pollution tolerant family Hydropsychidae) to the total number of individuals in a sample. Percent Plecoptera + Trichoptera (Excluding Hydropsychidae) is expected to decrease in response to environmental disturbance. Percent Plecoptera + Trichoptera (Excluding Hydropsychidae) can range from 0-35.6 for the VA-SCI.
- **Percent Scrapers.** The Percent Scrapers represents the ratio of taxa adapted primarily for scraping food from a substrate to the total number of individuals in a sample. Percent Scrapers is expected to decrease in response to environmental disturbance. Percent Scrapers can range from 0-51.6 for the VA-SCI.
- **Percent Chironomidae.** The Percent Chironomidae represents the ratio of members of the aquatic insect family Chironomidae (non-biting midges) to the total number of individuals in a sample. Because chironomids are generally tolerant to pollution, Percent Chironomidae is expected to increase in response to environmental disturbance. Percent Chironomidae can range from 0-100 for the VA-SCI.
- **Percent Top Two Dominant.** The Percent Top Two Dominant is the ratio of the top two most abundant taxa in a sample to the total number of individuals in a sample. Percent Top Two Dominant is expected to increase in response to environmental disturbance. Percent Top Two Dominant can range from 30.8-100 for the VA-SCI.
- **Hilsenhoff Biotic Index (HBI).** The Hilsenhoff Biotic Index is the abundance-weighted average tolerance of assemblage of organisms (Family taxonomic level). The HBI is expected to increase in response to environmental disturbance. The HBI can range from 3.2-10 for the VA-SCI.
- **The VA-SCI was calculated by taking the weighted average of the individual metric (and index) scores, with an VA-SCI range of 0-100. The weighting is as follows:**

Total Taxa: Score = $100 \times (X/22)$, where X = Metric Value

EPT Taxa: Score = $100 \times (X/11)$, where X = Metric Value

Percent Ephemeroptera: Score = $100 \times (X/61.3)$, where X = Metric Value

Percent Plecoptera + Trichoptera less Hydropsychidae: Score = $100 \times (X/35.6)$, where X = Metric Value

Percent Scrapers: Score = $100 \times (X/51.6)$, where X = Metric Value

Percent Chironomidae: Score = $100 \times [(100-X) (100-0)]$, where X = Metric Value

Percent Top 2 Dominant: Score = $100 \times [(100-X) (100-30.8)]$, where X = Metric Value

Hilsenhoff Biotic Index: Score = $100 \times [(100-X) (100-3.2)]$, where X = Metric Value

Each reach was then assigned a narrative rating according to the calculated VA-SCI, where "Excellent" is >73, "Good" is 60-72, "Stress" is 43-59, and "Severe Stress" is <42.

Biological Stream Monitoring Results and Discussion Habitat results show that all stream reaches, with the exception of Stream Reach 3-A, have either “Poor” or “Fair” habitat conditions (Table 2, below; Exhibit 6). Reach 3-A has the best habitat, with a habitat assessment score of 157 out of 200 (“Good”). Reach 7-A has the worst habitat, with a habitat assessment score of 86 out of 200 (“Poor”). The low habitat assessment scores are due to the lack of epifaunal substrate/available cover for stream fauna, highly embedded epifaunal substrate, overwidened stream channels, bank instability, and lack of vegetation protection along the stream banks. The average habitat assessment score for all streams assessed within the Colvin Run Watershed portion of the NVSRB is 124, which is 62 percent of the best possible score (“Fair”).

Benthic macroinvertebrate results show that individuals from 31 taxa¹² were collected from all ten reaches collectively (Table 3, below; Exhibit 5B) during the pre-construction benthic macroinvertebrate monitoring. Of the stream reaches sampled, a minimum of 95 to a maximum of 130 individual macroinvertebrates were found per stream reach. Of all 31 taxa collected, non-biting midge larvae (*Chironomidae*) comprised the majority of individuals in each reach. Numbers ranged from 44-121 individuals per stream reach sampled, and these numbers comprised between 40 to 95% of the total number of individuals captured.

The data in Table 3 collected for each reach were used to calculate the biotic metrics, indices, and VA-SCI. The results of our data analysis indicate that all ten stream reaches are in “Severe Stress” prior to stream restoration activities based on their VA-SCI scores (Table 4). The highest VA-SCI score was observed at Reach 3-A (37.78) and the lowest VA-SCI score was observed at Reach 9-A (10.05). The average VA-SCI numerical score for all streams assessed within the Colvin Run Watershed portion of the NVSRB is 20.06 (“Severe Stress”).

REACH	Habitat Assessment Score	Percent Best Possible Score	Narrative Rating
1-A	145	73	Fair
2-A	95	48	Poor
2-B	121	61	Fair
3-A	157	79	Good
4-A	129	65	Fair
5-A	122	61	Fair
6-A	113	57	Poor
7-A	86	43	Poor
8-A	123	62	Fair
9-A	148	74	Fair
Average	124	62	Fair

The data in Table 3 collected for each reach were used to calculate the biotic metrics, indices, and VA-SCI. The results of our data analysis indicate that all ten stream reaches are in “Severe Stress” prior to stream restoration activities based on their VA-SCI scores (Table 4).

¹² Although 35 taxa are listed in Table 3, Amphipoda, Gammaridea, and Oligochaeta were not included as part of the total taxa collected within the study area, because individuals were too damaged to identify to the family-level.

The highest VA-SCI score was observed at Reach 3-A (37.78) and the lowest VA-SCI score was observed at Reach 9-A (10.05). The average VA-SCI numerical score for all streams assessed within the Colvin Run Watershed portion of the NVSRB is 20.06 ("Severe Stress").

Given the low habitat scores, it is not surprising that the VA-SCI scores are low as well. In general, biological diversity and habitat in streams are closely linked (Raven et al. 1998). Thus, the low VA-SCI scores are likely due to several confounding abiotic factors, including highly impervious land cover, high nutrient, toxicant and sediment input from adjacent land use, channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, and lack of epifaunal substrate/available cover.

An analysis of land use within the watershed of each stream reach indicates that each watershed is highly developed, with all but one watershed having an imperviousness of over 20%, as depicted in the Land Cover Map ([Exhibit 8](#)), and [Table 6](#). It has been documented that increases in watershed imperviousness reduce macroinvertebrate diversity, such that when imperviousness exceeds 10 to 15 percent, macroinvertebrate diversity becomes low (Klein 1979). Thus, it is not surprising that each stream reach is in "severe stress" based on the VA-SCI scores. Runoff from the highly impervious land within these watersheds produces a high volume and velocity of flowing water and sediment in the stream channels during storm events.

Table 3. Colvin Run Branch Raw Data										
TAXA	REACH									
	1-A	2-A	2-B	3-A	4-A	5-A	6-A	7-A	8-A	9-A
Amphipoda	-	-	-	-	-	-	1	-	-	-
Ancylidae	3	1	-	-	-	-	-	-	-	-
Asellidae	-	-	-	-	-	-	1	-	1	-
Calopterygidae	2	-	-	-	-	-	-	-	-	-
Chironomidae	93	102	70	48	107	107	78	44	107	121
Coenagrionidae	-	-	-	12	-	-	-	-	-	-
Cranyonyctidae	-	-	-	21	-	-	12	3	-	-
Culicidae	-	-	-	-	-	-	-	1	-	-
Diptera Family #1	1	-	-	-	-	2	1	-	-	-
Diptera Family #2	-	-	-	-	-	1	2	-	-	-
Dixidae	-	-	-	-	-	5	16	-	-	-
Dytiscidae	-	-	-	-	-	-	-	2	-	-
Elmidae	-	-	-	19	1	-	-	-	-	-
Gammaridea	-	-	-	-	-	-	-	-	2	-
Halipidae	-	-	-	1	-	-	-	-	-	-
Hirudinea	2	-	-	-	-	-	-	-	-	-
Hydrobiidae	-	-	-	-	-	-	8	-	-	-
Hydropsychidae	2	-	-	8	3	-	-	-	-	-
Lepidoptera	-	-	-	1	-	-	-	-	-	-
Limnephilidae	-	-	-	-	-	-	-	1	-	-
Lumbricina	-	-	-	-	1	-	-	-	5	-
Nematoda	-	1	-	-	-	1	-	-	-	-
Nemouridae	-	-	-	-	-	-	-	3	-	-
Oligochaeta	-	1	-	-	-	-	-	-	-	2
Oligochaeta Family #1	2	-	-	2	5	-	1	-	-	-
Philopotamidae	-	8	-	2	-	-	-	2	-	-
Physidae	-	1	4	-	2	4	-	-	-	-
Planorbidae	4	-	-	-	-	-	-	-	-	-
Platyhelminthes	-	-	-	-	-	-	-	-	1	-
Simuliidae	-	-	-	4	-	-	-	-	-	-
Sphaeriidae	-	-	1	-	-	2	3	4	-	1
Tipulidae	1	-	-	-	-	-	4	-	1	-
Tubificidae	1	-	20	1	-	-	3	43	10	3
Uenoidae	-	-	-	-	-	-	-	1	-	-
Total	111	114	95	119	119	122	130	104	127	127

Table 4. Colvin Run Biotic Metric and Index Weighting and VA-SCI

METRIC	REACH									
	1-A	2-A	2-B	3-A	4-A	5-A	6-A	7-A	8-A	9-A
Total Taxa	45.45	27.27	18.18	50.00	27.27	31.82	50.00	45.45	31.82	13.64
EPT Taxa	9.09	9.09	0.00	18.18	9.09	0.00	0.00	36.36	0.00	0.00
Percent Ephemeroptera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Plecoptera + Trichoptera (Excluding Hydropsychidae)	0.00	19.71	0.00	4.72	0.00	0.00	0.00	18.91	0.00	0.00
Percent Scrapers	12.22	3.40	8.16	30.94	4.89	6.35	11.93	0.00	0.00	0.00
Percent Chironomidae	16.22	10.53	26.32	59.66	10.08	12.30	40.00	57.69	15.75	4.72
Percent Top Two Dominant	18.23	5.07	7.61	60.72	8.35	11.84	40.02	23.62	11.38	3.41
HBI	62.67	63.21	44.89	77.98	63.40	63.89	83.03	39.31	59.87	58.59
VA-SCI Numerical Score	20.48	17.29	13.14	37.78	15.40	15.77	28.12	27.67	14.85	10.05
VA-SCI Narrative Score	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress
Average VA-SCI Numerical Score	20.06									
Average VA-SCI Narrative Score	Severe Stress									

These VA-SCI scores are the result of the low number of total taxa, low number of total EPT taxa, lack of Ephemeroptera taxa, low percentage of Plecoptera + Trichoptera (excluding Hydropsychidae taxa), low percentage of Scraper taxa, high percentage of Chironomidae, high percentage of top two dominant taxa, and high HBI found within the reaches assessed (Table 5).

Table 5. Colvin Run Biotic Metric and Index Scores

Reach	Total Taxa	Total EPT Taxa	Percent Ephemeroptera	Percent Plecoptera + Trichoptera (Excluding Hydropsychidae)	Percent Scrapers	Percent Chironomidae	Percent Top Two Dominant	HBI
1-A	10	1	0.00	0	6.31	83.78	87.00	5.74
2-A	6	1	0.00	7.02	1.75	89.47	96.00	5.70
2-B	4	0	0.00	0.00	4.21	73.68	95.00	6.95
3-A	11	2	0.00	1.68	15.97	40.34	58.00	4.70
4-A	6	1	0.00	0.00	2.52	89.92	94.00	5.69
5-A	7	0	0.00	0.00	3.28	87.7	92.00	5.66
6-A	11	0	0.00	0.00	6.15	60.00	72.00	4.35
7-A	10	4	0.00	6.73	0.00	42.31	84.00	7.33
8-A	7	0	0.00	0.00	0.00	84.25	92.00	5.93
9-A	3	0	0.00	0.00	0.00	95.28	98.00	6.02

Because the streams we studied are laterally unstable (e.g., overwidened channel, lack of vegetative protection along the stream banks, and bank instability) and incised, these streams likely do not overflow their channel during bankfull flood events. As a result, epifaunal substrate/available cover within these streams becomes highly mobile and benthic macrofauna can not easily colonize the available substrate (Debrey and Lockwood 1990) or get buried and killed by high sediment deposition (Wood and Armitage 1997).

Nutrients, pesticides, and other chemical pollutants that enter the streams through runoff can also have a negative effect on the macroinvertebrate community (Wright et al 1995; O'Halloran et al. 1996; Kiffney and Clements 1994). Sources for such pollutants within the streams we assessed likely include residential lawns, roads, the Reston National Golf Course, waterfowl and faulty sewer lines. High amounts of such pollutants into streams inevitably result in a shift in macroinvertebrate community composition, where pollution tolerant taxa such as non-biting midges and oligochaete worms out-compete pollution sensitive taxa such as EPT (Shueler 1994). Thus, it is not a surprise that our baseline benthic macroinvertebrate data show low VA-SCI scores and non-biting midges as the dominant taxa. In addition, Maher (1999) found that highly suburbanized watersheds within Northern Virginia negatively impact macroinvertebrates and habitat when compared to forested areas with light development.

VII. Conclusions

The above results indicate that the pre-restoration habitat of the streams within the Colvin Run watershed portion of the NVSRB is "Poor" to "Fair" and the streams themselves are in "Severe Stress". The low VA-SCI and habitat scores are likely due to several confounding abiotic factors, including highly impervious land cover, high nutrient, toxicant and sediment input from adjacent land use, channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, and lack of epifaunal substrate/available cover.

VIII. Limitations

This study is based on examination of the conditions on the site at the time of our review and does not address conditions in the future. Such conditions may change over time and will be addressed in subsequent monitoring reports. Our biological monitoring report has been prepared

in accordance with generally accepted guidelines for the conduct of such evaluations. We make no other warranties, either expressed or implied, and our report is not a recommendation to buy, sell or develop the property.

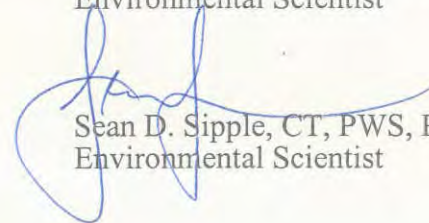
We offer no opinion and do not purport to opine on the possible application of various building codes, zoning ordinances, other land use or platting regulations, environmental or health laws and other similar statutes, laws, ordinances, code and regulations affecting the possible use and occupancy of the property for the purpose for which it is being used, except as specifically provided above. The opinions set forth above are rendered only and exclusively for the benefit of the addressees, the U.S. Army Corps of Engineers (COE), the Virginia Department of Environmental Quality (DEQ), and no other parties, successors or assigns. The foregoing opinions are based on applicable laws, ordinances, and regulations in effect as of the date hereof and should not be construed to be an opinion as to the matters set out herein should such laws, ordinances or regulations be modified, repealed or amended.

This document is solely for your benefit and is not to be quoted in whole or in part or otherwise referred to in any statement or document (except for purposes of identification) nor is it to be filed with any governmental agency or other person (other than the COE and DEQ), without the prior written consent of this firm, unless required by law.

WETLAND STUDIES AND SOLUTIONS, INC.



Benjamin N. Rosner, PWS, PWD
Environmental Scientist



Sean D. Sipple, CT, PWS, PWD
Environmental Scientist

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Exhibit 1

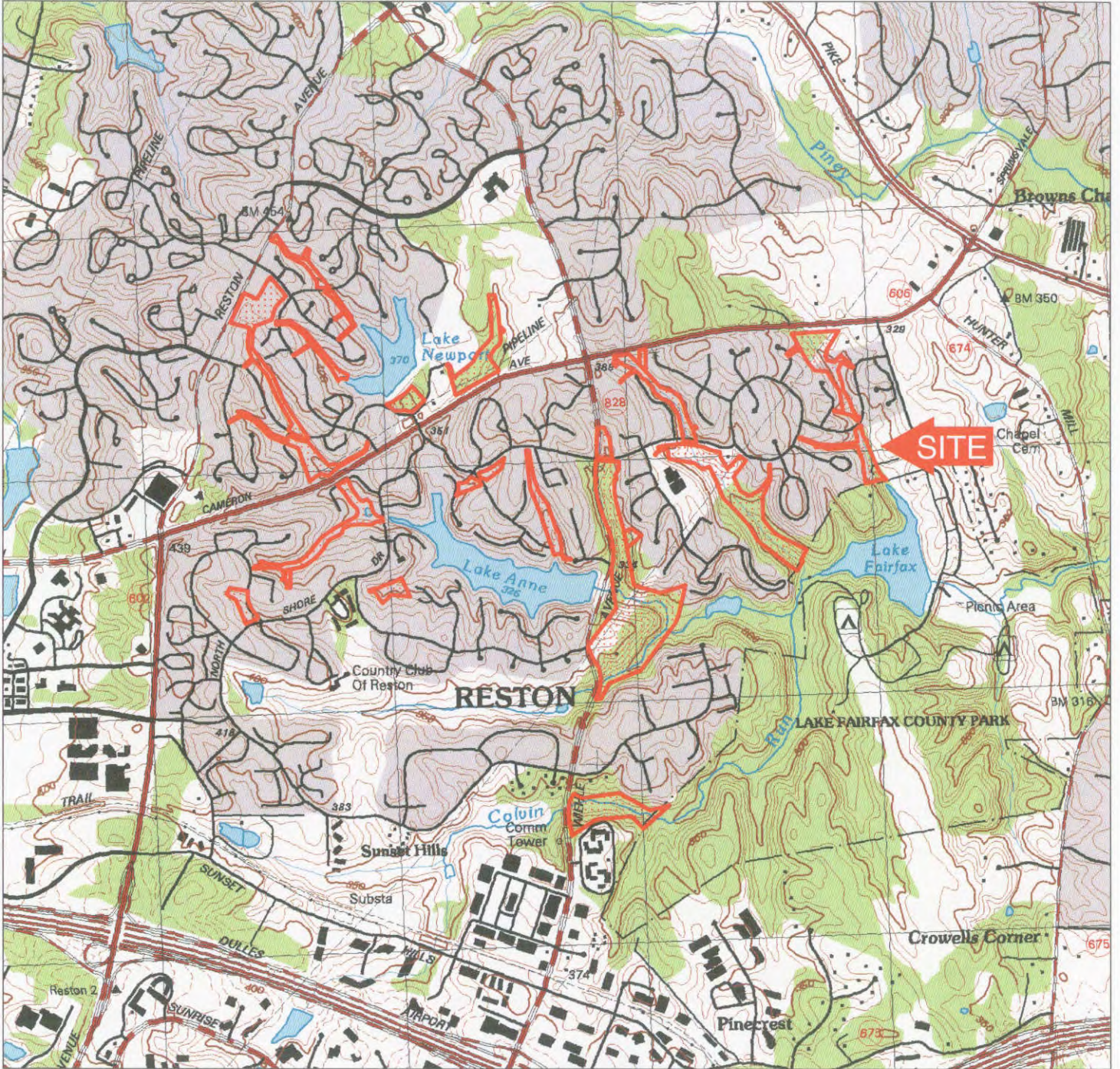


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Vicinity Map
Colvin Run
WSSI #2010
Scale: 1" = 2000'



Exhibit 2



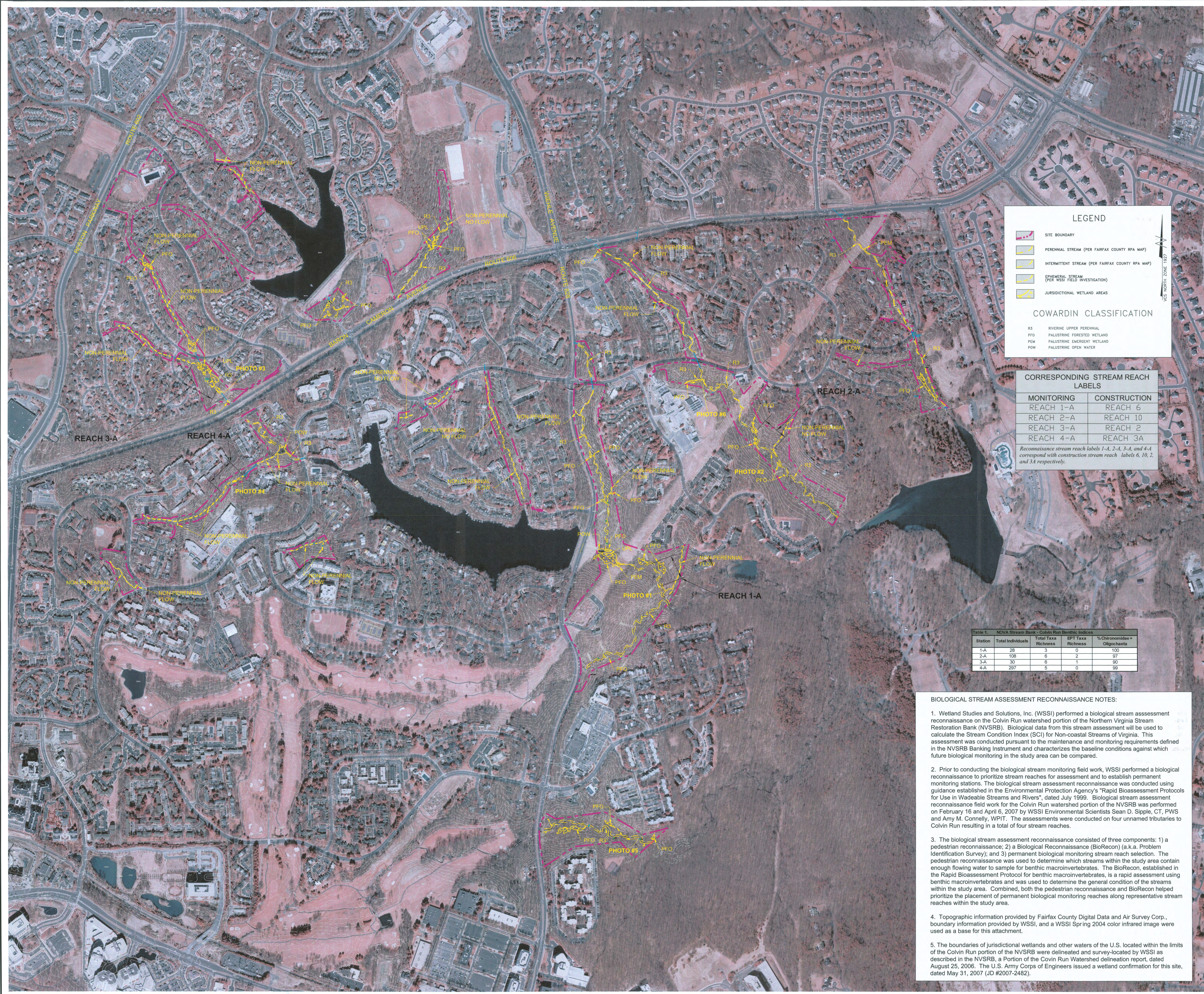
USGS Quad Map
Vienna, VA-MD 1994
Colvin Run
WSSI #20010
Scale: 1" = 2000'



Latitude: 38°58'09" N
Longitude: 77°20'06" W
Hydrologic Unit Code (HUC): 02070008
Stream Class: III
Name of Watershed: Colvin Run

Exhibit 3

Tab A



LEGEND

- SITE BOUNDARY
- PERENNIAL STREAM (PER FAIRFAX COUNTY RPA MAP)
- INTERMITTENT STREAM (PER FAIRFAX COUNTY RPA MAP)
- EPHEMERAL STREAM (PER WSSI FIELD INVESTIGATION)
- JURISDICTIONAL WETLAND AREAS

COWARDIN CLASSIFICATION

- R3 RIVERINE UPPER PERENNIAL
- PFO PALUSTRINE FORESTED WETLAND
- PEM PALUSTRINE EMERGENT WETLAND
- POW PALUSTRINE OPEN WATER

CORRESPONDING STREAM REACH LABELS

MONITORING	CONSTRUCTION
REACH 1-A	REACH 6
REACH 2-A	REACH 10
REACH 3-A	REACH 2
REACH 4-A	REACH 3A

Reconnaissance stream reach labels 1-A, 2-A, 3-A, and 4-A correspond with construction stream reach labels 6, 10, 2, and 3A respectively.

Table 1. NOVA Stream Bank - Colvin Run Benthic Indices

Station	Total Individuals	Total Taxa Richness	EPT Taxa Richness	%Chironomidae + Oligochaeta
1-A	28	3	0	100
2-A	108	6	2	97
3-A	30	6	1	90
4-A	297	5	0	99

BIOLOGICAL STREAM ASSESSMENT RECONNAISSANCE NOTES:

- Wetland Studies and Solutions, Inc. (WSSI) performed a biological stream assessment reconnaissance on the Colvin Run watershed portion of the Northern Virginia Stream Restoration Bank (NVSRB). Biological data from this stream assessment will be used to calculate the Stream Condition Index (SCI) for Non-coastal Streams of Virginia. This assessment was conducted pursuant to the maintenance and monitoring requirements defined in the NVSRB Banking Instrument and characterizes the baseline conditions against which future biological monitoring in the study area can be compared.
- Prior to conducting the biological stream monitoring field work, WSSI performed a biological reconnaissance to prioritize stream reaches for assessment and to establish permanent monitoring stations. The biological stream assessment reconnaissance was conducted using guidance established in the Environmental Protection Agency's "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers", dated July 1999. Biological stream assessment reconnaissance field work for the Colvin Run watershed portion of the NVSRB was performed on February 16 and April 6, 2007 by WSSI Environmental Scientists Sean D. Sipple, CT, PWS and Amy M. Connelly, WPIT. The assessments were conducted on four unnamed tributaries to Colvin Run resulting in a total of four stream reaches.
- The biological stream assessment reconnaissance consisted of three components: 1) a pedestrian reconnaissance; 2) a Biological Reconnaissance (BioRecon) (a.k.a. Problem Identification Survey); and 3) permanent biological monitoring stream reach selection. The pedestrian reconnaissance was used to determine which streams within the study area contain enough flowing water to sample for benthic macroinvertebrates. The BioRecon, established in the Rapid Bioassessment Protocol for benthic macroinvertebrates, is a rapid assessment using benthic macroinvertebrates and was used to determine the general condition of the streams within the study area. Combined, both the pedestrian reconnaissance and BioRecon helped prioritize the placement of permanent biological monitoring reaches along representative stream reaches within the study area.
- Topographic information provided by Fairfax County Digital Data and Air Survey Corp., boundary information provided by WSSI, and a WSSI Spring 2004 color infrared image were used as a base for this attachment.
- The boundaries of jurisdictional wetlands and other waters of the U.S. located within the limits of the Colvin Run portion of the NVSRB were delineated and survey-located by WSSI as described in the NVSRB, a Portion of the Colvin Run Watershed delineation report, dated August 25, 2006. The U.S. Army Corps of Engineers issued a wetland confirmation for this site, dated May 31, 2007 (JD #2007-2482).

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**NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN**
Fairfax County, Virginia

EXHIBIT 3A: BIOLOGICAL STREAM ASSESSMENT RECONNAISSANCE MAP

Computer File Name: Colvin_BioRecon.dwg
Design: JMT
Date: JMT
Appr: JMT
Scale: 1" = 300'

Horizontal Datum: NAD83
Vertical Datum: NGVD29
Boundary and Topo Source: Fairfax County Air Survey

REVISIONS

No.	Date	Description	App. By	Rev. By

DATE: MARCH 2008
SCALE: 1" = 300'

sheet # 1 of 1

L:\2008\200710\CAD\2006-ENVR\Colvin_BioRecon.dwg

Tab B

LEGEND

- SITE BOUNDARY
- PERENNIAL STREAM (PER FAIRFAX COUNTY RPA MAP)
- NON-PERENNIAL STREAM (PER FAIRFAX COUNTY RPA MAP)
- JURISDICTIONAL WETLAND AREAS

CORRESPONDING STREAM REACH LABELS

MONITORING	CONSTRUCTION
REACH 1A	REACH 12
REACH 2A	REACH 10
REACH 2B	REACH 9
REACH 3A	REACH 8
REACH 4A	REACH 7
REACH 5A	REACH 6
REACH 6A	REACH 6
REACH 7A	REACH 4
REACH 8A	REACH 3A
REACH 9A	REACH 2

Monitoring stream reach labels 1-A, 2-A, 2-B, 3-A, 4-A, 5-A, 6-A, 7-A, 8-A, and 9-A correspond with construction reach labels 12, 10, 9, 8, 7, 6, 6, 4, 3A, and 2 respectively.

BIOLOGICAL STREAM MONITORING NOTES:

1. Wetland Studies and Solutions, Inc. (WSSI) performed biological stream monitoring on the Colvin Run watershed portion of the Northern Virginia Stream Restoration Bank (NVSRB). Biological data from this stream assessment will be used to calculate the Stream Condition Index (SCI) for Non-coastal Streams of Virginia. This assessment was conducted pursuant to the maintenance and monitoring requirements defined in the NVSRB Banking Instrument and characterizes the baseline conditions against which future biological monitoring in the study area can be compared.
2. Prior to conducting the biological stream monitoring field work, WSSI performed a biological reconnaissance to prioritize stream reaches for assessment and to establish permanent monitoring stations. The biological stream assessment reconnaissance was conducted using guidelines established in the Environmental Protection Agency's "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers", dated July 1999. Biological stream assessment reconnaissance fieldwork for the Colvin Run watershed portion of the NVSRB was performed on February 16 and April 6, 2007 by WSSI Environmental Scientists Sean D. Sipple, CT, PWS and Amy M. Connelly, WPIT. The assessments were conducted on four unnamed tributaries to Colvin Run.
3. Based on the results of the biological assessment reconnaissance work, ten permanent monitoring stations were established along Colvin Run and eight unnamed tributaries to Colvin Run. Pre-construction biological monitoring fieldwork was conducted along these ten permanent monitoring stations between April 18 and April 20, 2007 by Sean D. Sipple, PWS, CT, Amy M. Connelly, PWD, WPIT, Benjamin N. Rosner, PWS, PWD, and Beth A. Clements.
4. Topographic information provided by Fairfax County Digital Data and Air Survey Corp., boundary information provided by WSSI, and a WSSI Spring 2004 color infrared image were used as a base for this attachment.
5. The boundaries of jurisdictional wetlands and other waters of the U.S. located within the limits of the Colvin Run portion of the NVSRB were delineated and survey-located by WSSI as described in the NVSRB, a Portion of the Colvin Run Watershed delineation report, dated August 25, 2006. The U.S. Army Corps of Engineers issued a wetland confirmation for this site, dated May 31, 2007 (JD #2007-2482).

Colvin Run Biotic Metric and Index Weighting and VA-SCI

METRIC	1-A	2-A	2-B	3-A	4-A	5-A	6-A	7-A	8-A	9-A
Total Taxa	45.45	27.27	18.18	50.00	27.27	31.82	50.00	45.45	31.82	13.64
EPT Taxa	3.09	3.09	3.09	18.18	3.09	0.00	0.00	38.36	0.00	0.00
Percent Ephemeroptera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Plecoptera + Trichoptera (Excluding Hydropterygidae)	0.00	19.71	0.00	4.72	0.00	0.00	0.00	18.91	0.00	0.00
Percent Scrapers	12.22	3.40	6.16	30.94	4.89	6.35	11.93	0.00	0.00	0.00
Percent Chironomidae	16.22	10.53	28.32	58.68	10.08	12.30	40.00	57.69	15.75	4.72
Percent Top Two Dominant	18.23	8.07	7.61	80.72	8.35	11.84	40.02	23.62	11.38	3.41
HBI	62.67	63.21	44.89	77.98	63.40	63.89	83.03	39.31	59.87	55.59
VA-SCI Numerical Score	20.48	17.29	13.14	37.78	15.40	15.77	28.12	27.87	14.85	10.96
VA-SCI Narrative Score	Severe	Severe	Severe	Severe	Severe	Severe	Severe	Severe	Severe	Severe
Average VA-SCI Numerical Score	20.06									
Average VA-SCI Narrative Score	Severe Stress									

Colvin Run Biotic Metric and Index Scores

Reach	Total Taxa	Total EPT Taxa	Percent Ephemeroptera	Percent Plecoptera + Trichoptera (Excluding Hydropterygidae)	Percent Scrapers	Percent Chironomidae	Percent Top Two Dominant	HBI
1-A	10	1	0.00	0	6.31	83.78	87.00	5.74
2-A	8	1	0.00	7.02	1.75	89.47	96.00	5.70
2-B	4	0	0.00	0.00	4.21	73.68	95.00	6.95
3-A	11	2	0.00	1.68	15.97	40.34	58.00	4.70
4-A	8	1	0.00	0.00	2.52	89.92	94.00	5.69
5-A	7	0	0.00	0.00	3.28	87.7	92.00	5.66
6-A	11	0	0.00	0.00	6.15	60.00	72.00	4.35
7-A	10	4	0.00	6.13	0.00	42.31	64.00	7.53
8-A	7	0	0.00	0.00	0.00	84.25	92.00	5.93
9-A	3	0	0.00	0.00	0.00	95.28	98.00	6.02

Total Habitat Assessment Scores

Reach	Habitat Assessment Score	Percent Best Possible Score	Narrative Rating
1-A	145	73	Fair
2-A	95	48	Poor
2-B	121	61	Fair
3-A	157	79	Good
4-A	129	65	Fair
5-A	122	61	Fair
6-A	113	57	Poor
7-A	86	43	Poor
8-A	123	62	Fair
9-A	148	74	Fair
Average	124	62	Fair

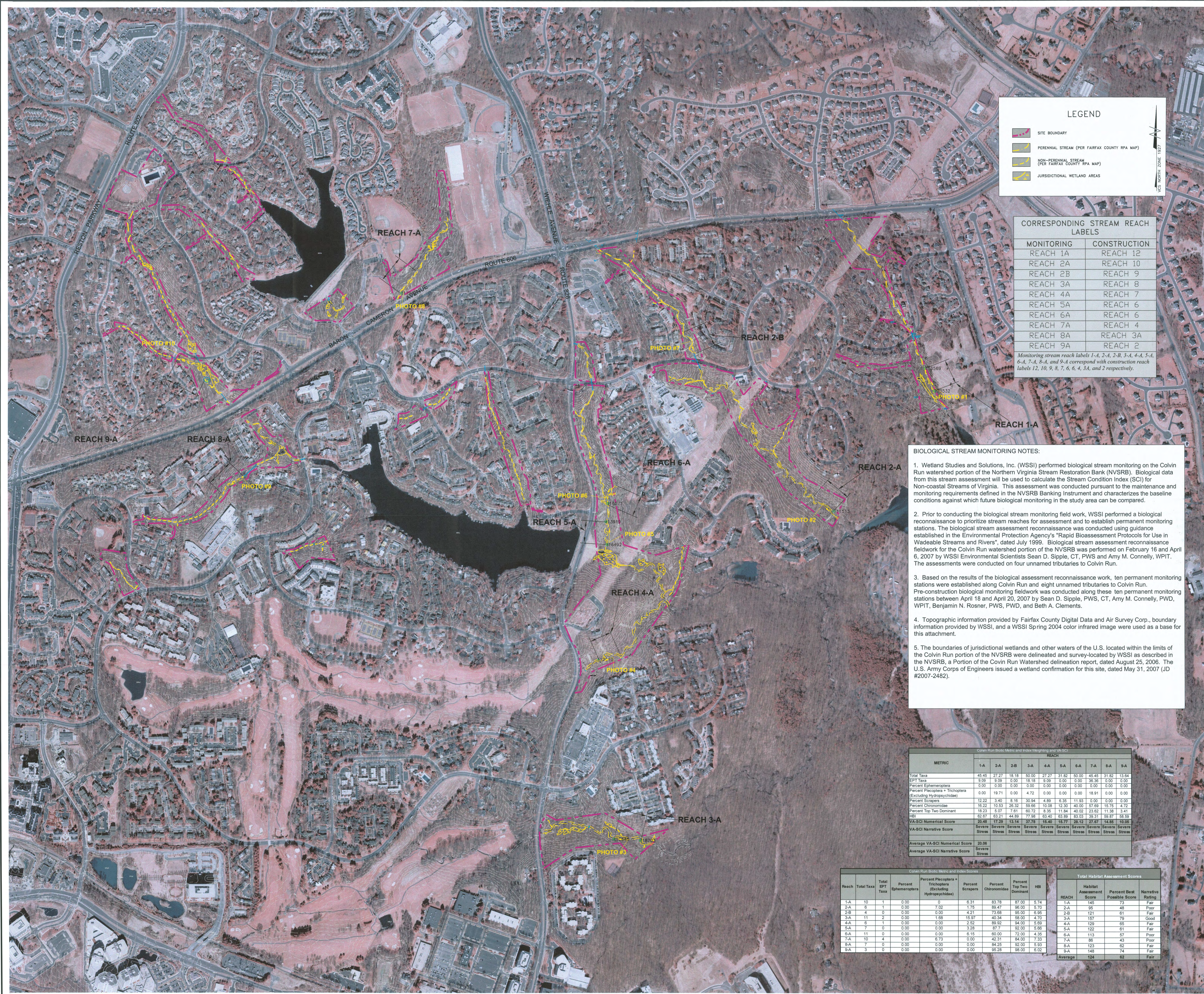


Exhibit 4

Tab A

EXHIBIT 4A
BIOLOGICAL STREAM ASSESSMENT RECONNAISSANCE PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010



1. Looking north-northwest (upstream) at Reach 1-A of an unnamed tributary of Colvin Run in the eastern portion of the study area.



2. Looking north-northwest (upstream) at Reach 2-A of an unnamed tributary of Lake Fairfax in the eastern portion of the study area.

EXHIBIT 4A
BIOLOGICAL STREAM ASSESSMENT RECONNAISSANCE PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010



3. Looking west (upstream) at Reach 3-A of Colvin Run in the southern portion of the study area.



4. Looking southwest (upstream) at Reach 4-A of an unnamed tributary of Colvin Run in the southern portion of the study area.

EXHIBIT 4A
BIOLOGICAL STREAM ASSESSMENT RECONNAISSANCE PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010



5. Looking west-northwest (upstream) at Colvin Run in the southern portion of the study area. This is representative of some of the stream reaches that were not samplable due to lack of flow.



6. Looking north-west (upstream) at a portion of an unnamed tributary of Colvin Run in the north-central portion of the study area. This is representative of some of the stream reaches that were not samplable due to lack of flow.

Tab B

**EXHIBIT 4B
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010**



1. Looking north-northwest (upstream) at Reach 1-A of an unnamed tributary of Lake Fairfax in the eastern portion of the study area.



2. Looking southeast (downstream) at Reach 2-A of an unnamed tributary of Lake Fairfax in the eastern portion of the study area.

**EXHIBIT 4B
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010**



3. Looking west (upstream) at Reach 3-A, Colvin Run, in the central portion of the study area.



4. Looking southwest (downstream) at Reach 4-A of an unnamed tributary of Colvin Run in the southern portion of the study area.

**EXHIBIT 4B
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010**



5. Looking north (upstream) at Reach 5-A of an unnamed tributary of Colvin Run in the central portion of the study area.



6. Looking northeast (upstream) at Reach 6-A of an unnamed tributary of Colvin Run in the central portion of the study area.

**EXHIBIT 4B
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010**



7. Looking south-southeast (downstream) at Reach 2-B of an unnamed tributary of Colvin Run in the eastern portion of the study area.



8. Looking northeast (upstream) at Reach 7-A of an unnamed tributary of Lake Anne in the northwestern portion of the study area.

**EXHIBIT 4B
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010**



9. Looking southwest (upstream) at Reach 8-A, an unnamed tributary of Lake Anne in the western portion of the study area.



10. Looking northwest (upstream) at Reach 9-A, an unnamed tributary of Lake Anne in the western portion of the study area.

Exhibit 5

Tab A

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	1-A	AMC/SDS	1	30
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/29/2007	11/28/2007	BNR	BNR	N/A	28
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE		Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculum sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	1	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicrochironomus sp.		Guttifelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydropterus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optioservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanyarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamasa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Symphothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthoclaadiinae	11	PELCO RHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twina sp.	
Crangonyx sp.		Heterotrissocladius sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladus sp.		Chrysogaster sp.	
CAMBARIDAE		Orthoclaadiinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrifidocladus sp.		TIPULIDAE	
Atherix sp.		Paratrissocladius sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psilometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilicladus sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	1-A	AMC/SDS	1	30
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/29/2007	11/28/2007	BNR	BNR	N/A	28
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilania sp.		HOPLOMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archana sp.		TAENIOPTERGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalis sp.		CALAMOCERATIDAE	
Centropilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phyllocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaesha sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Euryphella sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocuta sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trienodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNIPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONURIDAE		OLIGOCHAETA - Oligochaete Worms		MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE	16	PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormaldia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aeolosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Slagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acroneuria sp.		Polycentropus sp.	
PHYSIDAE		Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccopectura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlesta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perlina sp.</i>		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Cloperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE		COLLEMBOLA - Springtails	
BELOSTOMATIDAE		Pteronarcys sp.		ISOTOMURIDAE	
Belostoma sp.		PELTOPERLIDAE		Isotomurus sp.	
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Alicapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	2-A	AMC/SDS	1	108
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/28/2007	11/27/2007	JAB	JAB	N/A	108
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilania sp.		HOPLOMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanaera sp.		TAENIOPTERIGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centropilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phyllocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeschna sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	1
Eurylophella sp.		CORDULEGASTRIDAE		Dipterona sp.	1
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocuta sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trienodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNephilidae	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONEURIDAE		OLIGOCHAETA - Oligochaete Worms	41	MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAEDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE		PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormaldia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aeolosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonely Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acronuria sp.		Polycentropus sp.	
PHYSIDAE		Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccoptura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlenta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perlinella sp.</i>		Ryacophila sp.	
PLEUROTERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Clioperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cullus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCIDAE		COLLEMBOLA - Springtails	
BELOSTOMATIDAE		Pteronarcys sp.		ISOTOMURIDAE	
Belostoma sp.		PELTOPERLIDAE		Isotomurus sp.	
Lethocerus sp.		Leuctera sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphimura sp.			
Ranatra sp.		Ostrocera sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	3-A	AMC/SDS	1	30
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/29/2007	11/28/2007	BNR	BNR	N/A	30
BIVALVIA - Clams		Forcipomyia sp.		Synthochladius sp.	
SPHAERIDAE		Probezia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE		Tanypodinae	1
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicroptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
Optoservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Sticlochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini	8	Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanyarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rhetanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellina sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallius sp.		Tanytarsus sp.		Dbia sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chellifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocapala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthoclaadiinae	15	PELCORHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthoclaadius sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladius sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthoclaadiinae A		Eristalis sp.	
PALAEMONIDAE		Orthoclaadius sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenoclaadius sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrichocladius sp.		TIPULIDAE	
Atherix sp.		Paratrichocladius sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthoclaadius sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Pailometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladius sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	3-A	AMC/SDS	1	30
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/29/2007	11/28/2007	BNR	BNR	N/A	30
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilania sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archana sp.		TAENIOPTERIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalis sp.		CALAMOCERATIDAE	
Centropilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeschna sp.		HYDROPSYCHIDAE	1
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		CORDULEGASTRIDAE		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocutia sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trienodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNIPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONEURIDAE		OLIGOCHAETA - Oligochaete Worms		MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAEIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE		PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE	3	Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormaldia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aeolosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acronuria sp.		Polycentropus sp.	
PHYSIDAE	2	Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccoptura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlenta sp.		RHYACOPHILIDAE	
Gyraulus sp.		Perlinella sp.		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Clioperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE		COLLEMBOLA - Springtails	
BELOSTOMATIDAE		Pteronarcys sp.		ISOTOMURIDAE	
Belostoma sp.		PELTOPERLIDAE		Isotomurus sp.	
Lethocerus sp.		LEUCTRIDAE			
CORIXIDAE		Leuctra sp.			
GELASTOCORIDAE		Zealuctra sp.			
GERRIDAE		Paraluctra sp.			
Tropobates sp.		CAPNIDAE			
HEBRIDAE		Allocapnia sp.			
HYDROMETRIDAE		Paracapnia sp.			
MESOVELIIDAE		NEMOURIDAE			
NEPIDAE		Nemoura sp.			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	4-A	SDS/AMC	1	N/A
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/30/2007	4/13/2007	JAB	BAA	N/A	297
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE		Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAEBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	16	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicroptochironomus sp.		Guttipolopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccomis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloopus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
Optioservus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini	2	Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanytarsus complex		Orthopodomia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodya sp.		Stempellina sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chellifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae	269	PELCOHRHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselephus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE		Eukiefferiella sp.		Nephia sp.	
Stygonectes sp.	2	Heleniella sp.		Twina sp.	
Crangonyx sp.		Heterotrissocladius sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ecternia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.	1	Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrichocladius sp.		TIPULIDAE	
Atherix sp.		Paratrisocladius sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psilometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladius sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	4-A	SDS/AMC	1	N/A
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/30/2007	4/13/2007	JAB	BAA	N/A	297
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostola sp.	
Pilania sp.		HOPLOMERETEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERA		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanaera sp.		TAenioPTERGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalis sp.		CALAMOCERATIDAE	
Centropilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phyllocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeshna sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		CORDULEGASTRIDAE		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocuta sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthis sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trienodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNephILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isorychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONURIDAE		OLIGOCHAETA - Oligochaete Worms		MOLLANIIDAE	
Siphonurus sp.		LUMBRICINA		Mollanna sp.	
TRICORYTHIDAE		ENCHYTRAIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE		PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE	7	Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormaldia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aelosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acroneuria sp.		Polycentropus sp.	
PHYSIDAE		Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccopectura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlesta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perlina</i> sp.		Rhyacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Clopperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE		COLLEMBOLA - Springtails	
BELOSTOMATIDAE		Pteronarcys sp.		ISOTOMURIDAE	
Belostoma sp.		PELTOPELIDAE		Isotomurus sp.	
Lethocerus sp.		LEUCTRIDAE			
CORIXIDAE		Leuctra sp.			
GELASTOCORIDAE		Zealuctra sp.			
GERRIDAE		Paraleuctra sp.			
Trepobates sp.		CAPNIDAE			
HEBRIDAE		Allocapnia sp.			
HYDROMETRIDAE		Paracapnia sp.			
MESOVELIIDAE		NEMOURIDAE			
NEPIDAE		Amphinemura sp.			
Nepa sp.		Ostrocerca sp.			
Ranatra sp.		Nemoura sp.			
VELIIDAE					

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

Tab B

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	2-A	SDS/AMC	1	122
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	8/16/2007	JAB	MHS	21	114
BIVALVIA - Clams		Forcipomyia sp.			Synorthocladus sp.
SPHAERIDAE		Probezzia sp.			Thienemanniella sp.
Sphaerium sp.		Sphaeromias sp.			Tvetenia sp.
Pisidium sp.		Stiobezzia sp.			Unniella sp.
Musculium sp.		CHAOBORIDAE			Xylotopus sp.
CORBICULIDAE		Chaborus sp.			Zalutschia sp.
Corbicula fluminea sp.		CHIRONOMIDAE	102		Tanypodinae
UNIONIDAE		Chironominae			Ablabesmyia sp.
BRANCHIOBELLELLIDA		Chironomini			Alotanypus sp.
BRANCHIOBELLELLIDAE		Chironomus sp.			Apsectrotanypus sp.
TETRASTEMMATIDAE		Cryptochironomus sp.			Clinotanypus sp.
COLEOPTERA - Beetles		Cryptotendipes sp.			Conchapelopia sp.
CANTHERIDAE		Demicryptochironomus sp.			Guttipelopia sp.
CURCULIONIDAE		Dicrotendipes sp.			Krenopelopia sp.
DRYOPIDAE		Einfeldia sp.			Labrundinia sp.
Helichus sp.		Endochironomus sp.			Larsia sp.
DYTISCIDAE		Glyptotendipes sp.			Macropelopia sp.
Agabus sp.		Kiefferulus sp.			Meropelopia sp.
Hydroporus sp.		Microtendipes sp.			Paramerina sp.
Coptotomus sp.		Nitohauma sp.			Pentaneura sp.
Oreodytes sp.		Pagastella sp.			Procladius sp.
Laccornis sp.		Parachironomus sp.			Psectrotanypus sp.
Dytiscus sp.		Paracladopelma sp.			Rheopelopia sp.
ELMIDAE		Paratendipes sp.			Tanypus sp.
Microcylopeus sp.		Phaenopsectra sp.			Thienemannimyia gp.
Optioservus sp.		Polypedilum sp.			Thienemannimyia sp.
Stenelmis sp.		Stenochironomus sp.			Trissopelopia sp.
Promoresia sp.		Stictochironomus sp.			Zavrelimyia sp.
Macronychus sp.		Tribelos sp.			CULICIDAE
Dubiraphia sp.		Zavreliella sp.			Aedes
Ancyronyx sp.		Tanytarsini			Anopheles
Oulimnius sp.		Cladotanytarsus sp.			Culex
GYRINIDAE		Constempellina sp.			Culiseta
Dineutus		Microsectra sp.			Mansonia
Gyrinus		Microsectra/Tanytarsus complex			Orthopodomyia
HALIPIDAE		Paratanytarsus sp.			Psorophora
Halipus sp.		Rheotanytarsus sp.			Toxorhynchites
HYDROPHILIDAE		Stempellina sp.			Uranotaenia
Cymbiodya sp.		Stempellinella sp.			Wyeomyia
Berosus sp.		Sublettea sp.			DIXIDAE
Derallus sp.		Tanytarsus sp.			Dixa sp.
Helochaeres sp.		Zavrella sp.			DOLICHOPODIDAE
Helophorus sp.		Diamesinae			EMPIDIDAE
Hydrophilus sp.		Diamesa sp.			Cheilifera sp.
Hydrochus sp.		Pagastia sp.			Clinocera sp.
Tropisternus sp.		Pothastia sp.			Hemerodromia sp.
Hydrobius sp.		Prodiamesa sp.			Dolichocephala sp.
Laccobius sp.		Sympothastia sp.			EPHYRIDAE
PSEPHENIDAE		Orthocladinae			PELCOHRHYNCHIDAE
Psephenus sp.		Brillia sp.			Glutops sp.
Ectopria sp.		Cardiocladius sp.			PSYCHODIDAE
Dicranopelaphus sp.		Chaetocladius sp.			Pericoma sp.
PTILODACTYLIDAE		Corynoneura sp.			Psychoda sp.
Anchyrtarsus sp.		Cricotopus sp.			SIMULIDAE
COPEPODA		Cricotopus/Orthocladus sp.			Simulium sp.
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.			Prosimulium sp.
CRANGONYCTIDAE		Eukiefferiella sp.			Cnephia sp.
Stygonectes sp.		Heleniella sp.			Twinia sp.
Crangonyx sp.		Heterofrissocladius sp.			Stegopterna sp.
Synurella sp.		Hydrobaenus sp.			Ectemnia sp.
GAMMARIDAE		Limnophyes sp.			STRATIOMYIDAE
Gammarus sp.		Lopescladius sp.			Oxycera sp.
HYALELLIDAE		Mesocricotopus sp.			Odontomyia sp.
Hyalella sp.		Mesosmittia sp.			SYRPHIDAE
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.			Chrysogaster sp.
CAMBARIDAE		Orthocladinae A			Eristalis sp.
PALAEONIDAE		Orthocladus sp.			TABANIDAE
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.			Chrysops sp.
ASELIDAE		Parakiefferiella sp.			Tabanus sp.
Caecidotea sp.		Parametricnemus sp.			TANYDERIDAE
Lirceus sp.		Paraphaenocladus sp.			THAUMALEIDAE
DIPTERA - True Flies		Parasmittia sp.			Thaumalea sp.
ATHERICIDAE		Paratrichocladius sp.			TIPULIDAE
Atherix sp.		Paratrissocladius sp.			Antocha sp.
BLEPHARICERIDAE		Psectrocladius sp.			Hexatoma sp.
CECIDOMYIIDAE		Pseudorthocladus sp.			Leptotarsus sp.
CERATOPOGONIDAE		Psilometricnemus sp.			Molophilus sp.
Alluaudomyia sp.		Rhaecricotopus sp.			Tipula sp.
Bezzia sp.		Rheosmittia sp.			Pseudolimonophila sp.
Ceratopogon sp.		Smittia sp.			Dicranota sp.
Culicoides sp.		Sitocladius sp.			Limnophila sp.
Dasyhelea sp.		Symposiocladius sp.			Ormosia sp.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted																																																																																																																																																																																																																																																																																																																																				
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Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd																																																																																																																																																																																																																																																																																																																																				
11/27/2007	8/16/2007	JAB	MHS	21	114																																																																																																																																																																																																																																																																																																																																				
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr style="background-color: #e0f0ff;"> <th style="width: 25%;">Taxa</th> <th style="width: 25%;">Taxa</th> <th style="width: 25%;">Taxa</th> <th style="width: 25%;">Taxa</th> </tr> </thead> <tbody> <tr> <td>Pedicia sp.</td> <td>Microvelia sp.</td> <td></td> <td>Paranemoura sp.</td> </tr> <tr> <td>Limonia sp.</td> <td>HIRUDINEA - Leeches</td> <td></td> <td>Prostolia sp.</td> </tr> <tr> <td>Pilaria sp.</td> <td>HOPLOMERTEA - Ribbon Worms</td> <td></td> <td>Shipsa sp.</td> </tr> <tr> <td>Erioptera sp.</td> <td>TETRASTEMMATIDAE</td> <td></td> <td>CHLOROPERLIDAE</td> </tr> <tr> <td>Rhabdomastix sp.</td> <td>Prostoma sp.</td> <td></td> <td>Alloperla sp.</td> </tr> <tr> <td>TRICHOPTERIDAE</td> <td>LEPIDOPTERA - Moth Larvae</td> <td></td> <td>Haploperla sp.</td> </tr> <tr> <td>Trichocera sp.</td> <td>NOCTUIDAE</td> <td></td> <td>Sweltsa sp.</td> </tr> <tr> <td>EPHEMEROPTERA - Mayflies</td> <td>Archana sp.</td> <td></td> <td>TAENIOPTERIDAE</td> </tr> <tr> <td>AMELETIDAE</td> <td>Bellura sp.</td> <td></td> <td>Strophopteryx sp.</td> </tr> <tr> <td>Ameletus sp.</td> <td>PYRALIDAE</td> <td></td> <td>Taeniopteryx sp.</td> </tr> <tr> <td>BAETIDAE</td> <td>MEGALOPTERA - Dobsonflies</td> <td></td> <td>TRICHOPTERA - Caddisflies</td> </tr> <tr> <td>Acentrella sp.</td> <td>CORYDALIDAE</td> <td></td> <td>BRACHYCENTRIDAE</td> </tr> <tr> <td>Acerpenna sp.</td> <td>Chauliodes sp.</td> <td></td> <td>Brachycentrus sp.</td> </tr> <tr> <td>Baetis sp.</td> <td>Corydalus sp.</td> <td></td> <td>CALAMOCERATIDAE</td> </tr> <tr> <td>Centroptilum sp.</td> <td>Nigronia sp.</td> <td></td> <td>Heteroplectron sp.</td> </tr> <tr> <td>Dipheter sp.</td> <td>SIALIDAE</td> <td></td> <td>DIPSEUDOPSIDAE</td> </tr> <tr> <td>BAETISCIDAE</td> <td>Sialis sp.</td> <td></td> <td>Phylocentropus sp.</td> </tr> <tr> <td>Baetisca sp.</td> <td>NEMATODA - Roundworms</td> <td>1</td> <td>GLOSSOSOMATIDAE</td> </tr> <tr> <td>CAENIDAE</td> <td>NEMATOMORPHA - Horsehair Worms</td> <td></td> <td>Glossosoma sp.</td> </tr> <tr> <td>Caenis sp.</td> <td>ODONATA (Anisoptera - Dragonflies)</td> <td></td> <td>Agapetus sp.</td> </tr> <tr> <td>EPHEMERELLIDAE</td> <td>AESHNIDAE</td> <td></td> <td>HELICOPSYCHIDAE</td> </tr> <tr> <td>Dannella sp.</td> <td>Anax sp.</td> <td></td> <td>Helicopsyche sp.</td> </tr> <tr> <td>Drunella sp.</td> <td>Basiaesha sp.</td> <td></td> <td>HYDROPSYCHIDAE</td> </tr> <tr> <td>Ephemerella sp.</td> <td>Boyeria sp.</td> <td></td> <td>Cheumatopsyche sp.</td> </tr> <tr> <td>Eurylophella sp.</td> <td>CORDULEGASTRIDAE</td> <td></td> <td>Dipterona sp.</td> </tr> <tr> <td>Serratella sp.</td> <td>Cordulegaster sp.</td> <td></td> <td>Hydropsyche sp.</td> </tr> <tr> <td>EPHEMERIDAE</td> <td>CORDULIDAE</td> <td></td> <td>Parapsyche sp.</td> </tr> <tr> <td>Ephemerella sp.</td> <td>GOMPHIDAE</td> <td></td> <td>Potamyia sp.</td> </tr> <tr> <td>HEPTAGENIDAE</td> <td>Argemphus sp.</td> <td></td> <td>HYDROPTILIDAE</td> </tr> <tr> <td>Epeorus sp.</td> <td>Gomphus sp.</td> <td></td> <td>Hydroptila sp.</td> </tr> <tr> <td>Leucrocota sp.</td> <td>Hagenius sp.</td> <td></td> <td>Leucotrichia sp.</td> </tr> <tr> <td>Stenacron sp.</td> <td>Lanthus sp.</td> <td></td> <td>Ochrotrichia sp.</td> </tr> <tr> <td>Stenonema sp.</td> <td>Stylogomphus sp.</td> <td></td> <td>LEPIDOSTOMATIDAE</td> </tr> <tr> <td>LEPTOPHLEBIDAE</td> <td>LIBELLULIDAE</td> <td></td> <td>Lepidostoma sp.</td> </tr> <tr> <td>Leptophlebia sp.</td> <td>MACROMIIDAE</td> <td></td> <td>LEPTOCERIDAE</td> </tr> <tr> <td>Habrophlebia sp.</td> <td>Macromia sp.</td> <td></td> <td>Trienodes sp.</td> </tr> <tr> <td>Habrophlebiodes sp.</td> <td>PETALURIDAE</td> <td></td> <td>Ceraclaea sp.</td> </tr> <tr> <td>Paraleptophlebia sp.</td> <td>ODONATA Zygoptera - 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DENDROCOELIDAE	HEMIPTERA - True Bugs	PTERONARCYIDAE			BELOSTOMATIDAE	Pteronarcys sp.			Belostoma sp.	PELTOPERLIDAE			Lethocerus sp.	Peltoperla sp.			CORIXIDAE	LEUCTRIDAE			GELASTOCORIDAE	Leuctra sp.			GERRIDAE	Zealuctra sp.			Trepobates sp.	Paraluctra sp.			HEBRIDAE	CAPNIDAE			HYDROMETRIDAE	Allocapnia sp.			MESOVELIDAE	Paracapnia sp.			NEPIDAE	NEMOURIDAE			Nepa sp.	Amphinemura sp.			Ranatra sp.	Ostrocerca sp.			VELIDAE	Nemoura sp.		
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Serratella sp.	Cordulegaster sp.		Hydropsyche sp.																																																																																																																																																																																																																																																																																																																																						
EPHEMERIDAE	CORDULIDAE		Parapsyche sp.																																																																																																																																																																																																																																																																																																																																						
Ephemerella sp.	GOMPHIDAE		Potamyia sp.																																																																																																																																																																																																																																																																																																																																						
HEPTAGENIDAE	Argemphus sp.		HYDROPTILIDAE																																																																																																																																																																																																																																																																																																																																						
Epeorus sp.	Gomphus sp.		Hydroptila sp.																																																																																																																																																																																																																																																																																																																																						
Leucrocota sp.	Hagenius sp.		Leucotrichia sp.																																																																																																																																																																																																																																																																																																																																						
Stenacron sp.	Lanthus sp.		Ochrotrichia sp.																																																																																																																																																																																																																																																																																																																																						
Stenonema sp.	Stylogomphus sp.		LEPIDOSTOMATIDAE																																																																																																																																																																																																																																																																																																																																						
LEPTOPHLEBIDAE	LIBELLULIDAE		Lepidostoma sp.																																																																																																																																																																																																																																																																																																																																						
Leptophlebia sp.	MACROMIIDAE		LEPTOCERIDAE																																																																																																																																																																																																																																																																																																																																						
Habrophlebia sp.	Macromia sp.		Trienodes sp.																																																																																																																																																																																																																																																																																																																																						
Habrophlebiodes sp.	PETALURIDAE		Ceraclaea sp.																																																																																																																																																																																																																																																																																																																																						
Paraleptophlebia sp.	ODONATA Zygoptera - Damselflies		Oecetis sp.																																																																																																																																																																																																																																																																																																																																						
NEOEPHEMERIDAE	CALOPTERYGIDAE		LIMNIPHILIDAE																																																																																																																																																																																																																																																																																																																																						
OLIGONEURIDAE	Calopteryx sp.		Apatina sp.																																																																																																																																																																																																																																																																																																																																						
Isonychia sp.	COENAGRIONIDAE		Hydatophylax sp.																																																																																																																																																																																																																																																																																																																																						
POLYMITARCYIDAE	Argia sp.		Ironoquia sp.																																																																																																																																																																																																																																																																																																																																						
POTAMANTHIDAE	LESTIDAE		Pycnopsyche sp.																																																																																																																																																																																																																																																																																																																																						
SIPHONEURIDAE	OLIGOCHAETA - Oligochaete Worms	1	MOLANNIDAE																																																																																																																																																																																																																																																																																																																																						
Siphonurus sp.	LUMBRICINA		Molanna sp.																																																																																																																																																																																																																																																																																																																																						
TRICORYTHIDAE	ENCHYTRAELIDAE		ODONTOCERIDAE																																																																																																																																																																																																																																																																																																																																						
Tricorythodes sp.	NAIDIDAE		Pseidotreta sp.																																																																																																																																																																																																																																																																																																																																						
GASTROPODA - Snails	TUSIFICIDAE		PHILOPOTAMIDAE																																																																																																																																																																																																																																																																																																																																						
ANCYLIDAE	LUMBRICULIDAE		Chimarra sp.																																																																																																																																																																																																																																																																																																																																						
Ferissa sp.	POLYCHAETA - Polychaete Worms		Wormaldia sp.																																																																																																																																																																																																																																																																																																																																						
HYDROBIIDAE	AELOSOMATIDAE		PHRYGANEIDAE																																																																																																																																																																																																																																																																																																																																						
LYMNAEIDAE	Aelosoma sp.		Ptilostomis sp.																																																																																																																																																																																																																																																																																																																																						
Fossaria sp.	PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE																																																																																																																																																																																																																																																																																																																																						
Stagnicola sp.	PERLIDAE		Cymellus sp.																																																																																																																																																																																																																																																																																																																																						
Pseudosuccinea sp.	Acrona sp.		Polycentropus sp.																																																																																																																																																																																																																																																																																																																																						
PHYSIDAE	Belona sp.		PSYCHOMYIDAE																																																																																																																																																																																																																																																																																																																																						
Physella sp.	Eccopecta sp.		Lype sp.																																																																																																																																																																																																																																																																																																																																						
PLANORBIDAE	Neoperla sp.		Psychomyia sp.																																																																																																																																																																																																																																																																																																																																						
Menetus sp.	Perla sp.		RHYACOPHILIDAE																																																																																																																																																																																																																																																																																																																																						
Gyrallus sp.	<i>Perlinella</i> sp.		Ryacophila sp.																																																																																																																																																																																																																																																																																																																																						
PLEUROCERIDAE	PERLODIDAE		UENOIDAE																																																																																																																																																																																																																																																																																																																																						
VIVIPARIDAE	Cloperla sp.		Neophylax sp.																																																																																																																																																																																																																																																																																																																																						
Viviparus sp.	Diploperla sp.		TUBELLARIA - Flatworms																																																																																																																																																																																																																																																																																																																																						
HAPLOSCLERIDA	Isoperla sp.		PLANARIIDAE																																																																																																																																																																																																																																																																																																																																						
SPONGILLIDAE	Cultus sp.		DENDROCOELIDAE																																																																																																																																																																																																																																																																																																																																						
HEMIPTERA - True Bugs	PTERONARCYIDAE																																																																																																																																																																																																																																																																																																																																								
BELOSTOMATIDAE	Pteronarcys sp.																																																																																																																																																																																																																																																																																																																																								
Belostoma sp.	PELTOPERLIDAE																																																																																																																																																																																																																																																																																																																																								
Lethocerus sp.	Peltoperla sp.																																																																																																																																																																																																																																																																																																																																								
CORIXIDAE	LEUCTRIDAE																																																																																																																																																																																																																																																																																																																																								
GELASTOCORIDAE	Leuctra sp.																																																																																																																																																																																																																																																																																																																																								
GERRIDAE	Zealuctra sp.																																																																																																																																																																																																																																																																																																																																								
Trepobates sp.	Paraluctra sp.																																																																																																																																																																																																																																																																																																																																								
HEBRIDAE	CAPNIDAE																																																																																																																																																																																																																																																																																																																																								
HYDROMETRIDAE	Allocapnia sp.																																																																																																																																																																																																																																																																																																																																								
MESOVELIDAE	Paracapnia sp.																																																																																																																																																																																																																																																																																																																																								
NEPIDAE	NEMOURIDAE																																																																																																																																																																																																																																																																																																																																								
Nepa sp.	Amphinemura sp.																																																																																																																																																																																																																																																																																																																																								
Ranatra sp.	Ostrocerca sp.																																																																																																																																																																																																																																																																																																																																								
VELIDAE	Nemoura sp.																																																																																																																																																																																																																																																																																																																																								

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	2-B	BNR/BAA	1	126
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	7/17/2007	JAB	BHM	8	95
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE	1	Probezia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculum sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	70	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIODELLIDA		Chironomini		Alotanypus sp.	
BRANCHIODELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicrochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nitthauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastiella sp.		Procladius sp.	
Lacornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optioservus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zaveliella sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Microspectra sp.		Mansonia	
Gyrinus		Microspectra/Tanytarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodytia sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochaeres sp.		Zavelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diaminae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae		PELCOHORNYCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANGONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ecternia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladus sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEMONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Gaeckleia sp.		Parametrioctenemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrachocladus sp.		TIPULIDAE	
Atherix sp.		Paratrissocladus sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psiometroctenemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladus sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladus sp.		Omosia sp.	
Diptera #1 sp.					
Diptera #2 sp.					

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	2-B	BNR/BAA	1	126
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	7/17/2007	JAB	BHM	8	95
Pedicia sp.		Microvelia sp.			Paranemoura sp.
Limonia sp.		HIRUDINEA - Leeches			Prosthea sp.
Pilaria sp.		HOPLOMERTEA - Ribbon Worms			Shipsa sp.
Erioptera sp.		TETRASTEMMATIDAE			CHLOROPERLIDAE
Rhabdomastix sp.		Prostoma sp.			Alloperla sp.
TRICHOPTERA		LEPIDOPTERA - Moth Larvae			Haploperla sp.
Trichocera sp.		NOCTUIDAE			Sweltsa sp.
EPHEMEROPTERA - Mayflies		Archanaera sp.			TAENIOPTERGIDAE
AMELETIDAE		Bellura sp.			Strophopteryx sp.
Ameletus sp.		PYRALIDAE			Taeniopteryx sp.
BAETIDAE		MEGALOPTERA - Dobsonflies			TRICHOPTERA - Caddistflies
Acentrella sp.		CORYDALIDAE			BRACHYCENTRIDAE
Acerpenna sp.		Chauliodes sp.			Brachycentrus sp.
Baetis sp.		Corydalus sp.			CALAMOCERATIDAE
Centroptilum sp.		Nigronia sp.			Heteroplectron sp.
Dipheter sp.		SIALIDAE			DIPSEUDOPSIDAE
BAETISCIDAE		Sialis sp.			Phyllocentropus sp.
Baetisca sp.		NEMATODA - Roundworms			GLOSSOSOMATIDAE
CAENIDAE		NEMATOMORPHA - Horsehair Worms			Glossosoma sp.
Caenis sp.		ODONATA (Anisoptera - Dragonflies)			Agapetus sp.
EPHEMERELLIDAE		AESHNIDAE			HELICOPSYCHIDAE
Dannella sp.		Anax sp.			Helicopsyche sp.
Drunella sp.		Basiaesha sp.			HYDROPSYCHIDAE
Ephemerella sp.		Boyeria sp.			Cheumatopsyche sp.
Euryophella sp.		CORDULEGASTRIDAE			Dipterona sp.
Serratella sp.		Cordulegaster sp.			Hydropsyche sp.
EPHEMERIDAE		CORDULIDAE			Parapsyche sp.
Ephemera sp.		GOMPHIDAE			Potamyia sp.
HEPTAGENIIDAE		Arigomphus sp.			HYDROPTILIDAE
Epeorus sp.		Gomphus sp.			Hydroptila sp.
Leucocuta sp.		Hagenius sp.			Leucofricia sp.
Stenacron sp.		Lanthus sp.			Ochrotrichia sp.
Stenonema sp.		Stylogomphus sp.			LEPIDOSTOMATIDAE
LEPTOPHLEBIIDAE		LIBELLULIDAE			Lepidostoma sp.
Leptophlebia sp.		MACROMIIDAE			LEPTOCERIDAE
Habrophlebia sp.		Macromia sp.			Trienodes sp.
Habrophlebiodes sp.		PETALURIDAE			Ceraclea sp.
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies			Oecetis sp.
NEOEPHEMERIDAE		CALOPTERYGIDAE			LIMNIPHILIDAE
OLIGONEURIDAE		Calopteryx sp.			Apatina sp.
Isonychia sp.		COENAGRIONIDAE			Hydatophylax sp.
POLYMITARCYIDAE		Argia sp.			Ironoquia sp.
POTAMANTHIDAE		LESTIDAE			Pycnopsyche sp.
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaeta Worms			MOLANNIDAE
Siphonurus sp.		LUMBRICIDAE			Molanna sp.
TRICORYTHIDAE		ENCHYTRAEIDAE			ODONTOCERIDAE
Tricorythodes sp.		NAIDIDAE			Psilotreta sp.
GASTROPODA - Snails		TUBIFICIDAE		20	PHILOPOTAMIDAE
ANCYLIDAE		LUMBRICULIDAE			Chimarra sp.
Ferissa sp.		POLYCHAETA - Polychaete Worms			Wormaldia sp.
HYDROBIIDAE		AELOSOMATIDAE			PHRYGANEIDAE
LYMNAEIDAE		Aelosoma sp.			Ptilostomis sp.
Fossaria sp.		PLECOPTERA - Stonefly Larvae			POLYCENTROPIDAE
Stagnicola sp.		PERLIDAE			Cymellus sp.
Pseudosuccinea sp.		Acroneuria sp.			Polycentropus sp.
PHYSIDAE	4	Beloneuria sp.			PSYCHOMYIDAE
Physella sp.		Eccoptera sp.			Lype sp.
PLANORBIDAE		Neoperla sp.			Psychomyia sp.
Menetus sp.		Perfesta sp.			RHYACOPHILIDAE
Gyraulus sp.		<i>Perinella</i> sp.			Ryacophila sp.
PLEUROCERIDAE		PERLODIDAE			UFENOIDAE
VIVIPARIDAE		Cloperla sp.			Neophylax sp.
Viviparus sp.		Diploperla sp.			TUBELLARIA - Flatworms
HAPLOSCLERIDA		Isoperla sp.			PLANARIIDAE
SPONGILLIDAE		Cuflus sp.			DENDROCOELIDAE
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoerla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraleuctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	3-A	BNR/BAA	1	126
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/26/2007	8/20/2007	JMT	BTA	25	119
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE		Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Piskidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	48	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicroptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nitthauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE	19	Paratendipes sp.		Tanypus sp.	
Microcyloopus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
Optoservus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanytarsus complex		Orthopodomyia	
HALIPIDAE	1	Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodia sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Symphothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthoclaudiinae		PELICORHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	4
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda- Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANGONYCTIDAE	21	Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladus sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda- Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Liroeus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrichocladus sp.		TIPULIDAE	
Atherix sp.		Paratrisocladus sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psiometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladus sp.		Limnophila sp.	
Dasyhelea sp.		Symphosicladus sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	3-A	BNR/BAA	1	126
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/26/2007	8/20/2007	JMT	BTA	25	119
Pedicia sp.		Microvelia sp.			Paranemoura sp.
Limonia sp.		HIRUDINEA - Leeches			Prostoia sp.
Pilaria sp.		HOPLOMERTEA - Ribbon Worms			Shipsa sp.
Erioptera sp.		TETRASTEMMATIDAE			CHLOROPERLIDAE
Rhabdomastix sp.		Prostoma sp.			Alloperla sp.
TRICHOPTERA		LEPIDOPTERA - Moth Larvae	1		Haploperla sp.
Trichocera sp.		NOCTUIDAE			Sweltsa sp.
EPHEMEROPTERA - Mayflies		Archana sp.			TAenioPTERGIDAE
AMELETIDAE		Bellura sp.			Strophopteryx sp.
Ameletus sp.		PYRALIDAE			Taeniopteryx sp.
BAETIDAE		MEGALOPTERA - Dobsonflies			TRICHOPTERA - Caddisflies
Acentrella sp.		CORYDALIDAE			BRACHYCENTRIDAE
Acerpenna sp.		Chauliodes sp.			Brachycentrus sp.
Baetis sp.		Corydalus sp.			CALAMOCERATIDAE
Centroptilum sp.		Nigronia sp.			Heteroplectron sp.
Dipheter sp.		SIALIDAE			DIPSEUDOPSIDAE
BAETISCIDAE		Sialis sp.			Phylocentropus sp.
Baetisca sp.		NEMATODA - Roundworms			GLOSSOSOMATIDAE
CAENIDAE		NEMATOMORPHA - Horsehair Worms			Glossosoma sp.
Caenis sp.		ODONATA (Anisoptera - Dragonflies)			Agapetus sp.
EPHEMERELLIDAE		AESHNIDAE			HELICOPSYCHIDAE
Dannella sp.		Anax sp.			Helicopsyche sp.
Drunella sp.		Basiaesha sp.			HYDROPSYCHIDAE
Ephemerella sp.		Boyeria sp.			Cheumatopsyche sp.
Euryophelia sp.		CORDULEGASTRIDAE			Dipletrona sp.
Serratella sp.		Cordulegaster sp.			Hydropsyche sp.
EPHEMERIDAE		CORDULIDAE			Parapsyche sp.
Ephemera sp.		GOMPHIDAE			Potamyia sp.
HEPTAGENIIDAE		Argomphus sp.			HYDROPTILIDAE
Epeorus sp.		Gomphus sp.			Hydroptila sp.
Leucrocuta sp.		Hagenius sp.			Leucotrichia sp.
Stenacron sp.		Lanthus sp.			Ochrotrichia sp.
Stenonema sp.		Stylogomphus sp.			LEPIDOSTOMATIDAE
LEPTOPHLEBIIDAE		LIBELLULIDAE			Lepidostoma sp.
Leptophlebia sp.		MACROMIIDAE			LEPTOCERIDAE
Habrophlebia sp.		Macromia sp.			Trianaodes sp.
Habrophlebiodes sp.		PETALURIDAE			Ceraclaea sp.
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies			Oecetis sp.
NEOEPHEMERIDAE		CALOPTERYGIDAE			LIMNIPHILIDAE
OLIGONEURIDAE		Calopteryx sp.			Apalina sp.
Isonychia sp.		COENAGRIONIDAE	12		Hydatophylax sp.
POLYMITARCYIDAE		Argia sp.			Ironoquia sp.
POTAMANTHIDAE		LESTIDAE			Pycnopsyche sp.
SIPHONOURIDAE		OLIGOCHAETA - Oligochaete Worms			MOLANNIDAE
Siphonurus sp.		OLIGOCHAETA FAMILY #1	2		Molanna sp.
TRICORYTHIDAE		LUMBRICIDAE			ODONTOCERIDAE
Tricorythodes sp.		ENCHYTRAEIDAE			Psilotreta sp.
GASTROPODA - Snails		NAIDIDAE			PHILOPOTAMIDAE
ANCYLIDAE		TUBIFICIDAE	1		Chimarra sp.
Ferissa sp.		LUMBRICULIDAE			Wormaldia sp.
HYDROBIIDAE		POLYCHAETA - Polychaete Worms			PHRYGANEIDAE
LYMNAEIDAE		AELOSOMATIDAE			Ptilostomis sp.
Fossaria sp.		Aelosoma sp.			POLYCENTROPIDAE
Stagnicola sp.		PLECOPTERA - Stonefly Larvae			Cymellus sp.
Pseudosuccinea sp.		PERLIDAE			Polycentropus sp.
PHYSIDAE		Acroneuria sp.			PSYCHOMYIDAE
Physella sp.		Beloneuria sp.			Lype sp.
PLANORBIDAE		Eccoptura sp.			Psychomyia sp.
Menetus sp.		Neoperla sp.			RHYACOPHILIDAE
Gyraulus sp.		Perlenta sp.			Ryacophila sp.
PLEUROCERIDAE		<i>Perlinella sp.</i>			UENOIDAE
VIVIPARIDAE		PERLODIDAE			Neophylax sp.
Viviparus sp.		Cloperla sp.			TUBELLARIA - Flatworms
HAPLOSCLERIDA		Diploperla sp.			PLANARIIDAE
SPONGILLIDAE		Isoperla sp.			DENDROCOELIDAE
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		PTERONARCYIDAE			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		PELTOPERLIDAE			
CORIXIDAE		Peltoptera sp.			
GELASTOCORIDAE		LEUCTRIDAE			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		CAPNIDAE			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		NEMOURIDAE			
Ranatra sp.		Amphimemura sp.			
VELIIDAE		Ostrocerca sp.			
		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	4-A	BNR/BAA	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	9/26/2007	JMT	MHS	13	119
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE		Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	107	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicrochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Enfieldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nitthauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Lacornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE	1	Paratendipes sp.		Tanypus sp.	
Microcylopeus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
Optioservus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promesesa sp.		Sticlochironomus sp.		Zavelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zaveliella sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanytarsus complex		Orthopodomya	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavreila sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Symptothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae		PELCOHRYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopelaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda- Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANGONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda- Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametrocnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrachocladus sp.		TIPULIDAE	
Atherix sp.		Paratrisocladus sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIDAE		Pseudorthocladus sp.		Laptotarsus sp.	
CERATOPOGONIDAE		Psilometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Caicoides sp.		Sticocladius sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladus sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	4-A	BNR/BAA	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	9/26/2007	JMT	MHS	13	119
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostola sp.	
Pilaria sp.		HOPLONERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanaera sp.		TAENIOPTERGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Baiaeshna sp.		HYDROPSYCHIDAE	3
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocota sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trisenodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclaea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONOURIDAE		OLIGOCHAETA - Oligochaete Worms		MOLANNIDAE	
Siphonurus sp.		OLIGOCHAETA FAMILY #1	5	Molanna sp.	
TRICORYTHIDAE		LUMBRICIDAE	1	ODONTOCERIDAE	
Tricorythodes sp.		ENCHYTRAEIDAE		Paliotreta sp.	
GASTROPODA - Snails		NAIDIDAE		PHILOPOTAMIDAE	
ANCYLIDAE		TUBIFICIDAE		Chimarra sp.	
Ferissa sp.		LUMBRICULIDAE		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		PHRYGANEIDAE	
LYMNAEIDAE		AELOSOMATIDAE		Ptilostomis sp.	
Fossaria sp.		Aelosoma sp.		POLYCENTROPIDAE	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		PERLIDAE		Polycentropus sp.	
PHYSIDAE	2	Acronuria sp.		PSYCHOMYIDAE	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		RHYACOPHILIDAE	
Gyraulus sp.		Perlenta sp.		Rhyacophila sp.	
PLEUROCERIDAE		<i>Parinella</i> sp.		UENOIDAE	
VIVIPARIDAE		PERLODIDAE		Neophylax sp.	
Viviparus sp.		Cloperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		PLANARIIDAE	
SPONGILLIDAE		Isoperla sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		PTERONARCYIDAE			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		PELTOPERLIDAE			
CORIXIDAE		Peltoerla sp.			
GELASTOCORIDAE		LEUCTRIDAE			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		CAPNIDAE			
MESOVELIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		NEMOURIDAE			
Ranatra sp.		Amphinemura sp.			
VELIDAE		Ostrocerca sp.			
		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	5-A	BNR/BAA	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	9/20/2007	JAB	MHS	29	122
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE	2	Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	107	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicrochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Mercopelopia sp.	
Hydrophilus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nitthauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloopus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optioservus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanytarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	5
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chellifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae		PELCOHRYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopelaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANGONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEOMONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
DIPTERA FAMILY #1	2	Paratrichocladus sp.		TIPULIDAE	
DIPTERA FAMILY #2	1	Paratrisocladus sp.		Antocha sp.	
ATHERICIDAE		Psectrocladius sp.		Hexatoma sp.	
Atherix sp.		Pseudorthocladus sp.		Leptotarsus sp.	
BLEPHARICERIDAE		Psilometricnemus sp.		Molophilus sp.	
CECIDOMYIIDAE		Rheocricotopus sp.		Tipula sp.	
CERATOPOGONIDAE		Rheosmittia sp.		Pseudolimnophila sp.	
Alluaudomyia sp.		Smittia sp.		Dicranota sp.	
Bezzia sp.		Stilocladus sp.		Limnophila sp.	
Ceratopogon sp.		Symposiocladus sp.		Ormosia sp.	
Culicoides sp.					
Dasyhelea sp.					

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	6-A		1	127
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	8/707	JAB	MHS	N/A	130
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE	3	Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	78	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicroptochironomus sp.		Guttipeloplia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopeloplia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropeloplia sp.	
Agabus sp.		Kiefferulus sp.		Meropeloplia sp.	
Hydropterus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopeloplia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
Optoservus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopeloplia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanyarsus complex		Orthopodomysia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodya sp.		Stempellina sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	16
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chellifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Symphothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthoclaadiinae		PELCO RHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)	1	Diplocladius sp.		Prosimulium sp.	
CRANGONYCTIDAE	12	Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twina sp.	
Crangonyx sp.		Heterotrissocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ecternia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthoclaadiinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE	1	Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
DIPTERA FAMILY #1	1	Paratrachocladus sp.		TIPULIDAE	4
DIPTERA FAMILY #2	2	Paratrissocladus sp.		Antocha sp.	
ATHERICIDAE		Psectrocladius sp.		Hexatoma sp.	
Atherix sp.		Pseudorthocladus sp.		Leptotarsus sp.	
BLEPHARICERIDAE		Psilometricnemus sp.		Molophilus sp.	
CECIDOMYIIDAE		Rheocricotopus sp.		Tipula sp.	
CERATOPOGONIDAE		Rheosmittia sp.		Pseudolimnophila sp.	
Alluaudomyia sp.		Smittia sp.		Dicranota sp.	
Bezzia sp.		Stilocladus sp.		Limnophila sp.	
Ceratopogon sp.		Symposiocladius sp.		Ormosia sp.	
Culicoides sp.					
Dasyhelea sp.					

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	6-A	0	1	127
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/27/2007	8/707	JAB	MHS	N/A	130
Pedicia sp.		Microvelia sp.			Paranemoura sp.
Limonia sp.		HIRUDINEA - Leeches			Prosoia sp.
Pilaria sp.		HOPLOMERTEA - Ribbon Worms			Shipsa sp.
Erioptera sp.		TETRASTEMMATIDAE			CHLOROPERLIDAE
Rhabdomastix sp.		Prostoma sp.			Alloperla sp.
TRICHOPTERA		LEPIDOPTERA - Moth Larvae			Haploperla sp.
Trichocera sp.		NOCTUIDAE			Sweltsa sp.
EPHEMEROPTERA - Mayflies		Archanara sp.			TAENIOPTERIGIDAE
AMELETIDAE		Bellura sp.			Strophopteryx sp.
Ameletus sp.		PYRALIDAE			Taeniopteryx sp.
BAETIDAE		MEGALOPTERA - Dobsonflies			TRICHOPTERA - Caddisflies
Acentrella sp.		CORYDALIDAE			BRACHYCENTRIDAE
Acerpenna sp.		Chauliodes sp.			Brachycentrus sp.
Baetis sp.		Corydalis sp.			CALAMOCERATIDAE
Centropilum sp.		Nigronia sp.			Heteroplecton sp.
Diphetero sp.		SIALIDAE			DIPSEUDOPSIDAE
BAETISCIDAE		Sialis sp.			Phylocentropus sp.
Baetisca sp.		NEMATODA - Roundworms			GLOSSOSOMATIDAE
CAENIDAE		NEMATOMORPHA - Horsehair Worms			Glossosoma sp.
Caenis sp.		ODONATA (Anisoptera - Dragonflies)			Agapetus sp.
EPHEMERELLIDAE		AESHNIDAE			HELICOPSYCHIDAE
Dannella sp.		Anax sp.			Helicopsyche sp.
Drunella sp.		Basiaeschna sp.			HYDROPSYCHIDAE
Ephemerella sp.		Boyeria sp.			Cheumatopsyche sp.
Euryophella sp.		CORDULEGASTRIDAE			Dipterona sp.
Serratella sp.		Cordulegaster sp.			Hydropsyche sp.
EPHEMERIDAE		CORDULIDAE			Parapsyche sp.
Ephemera sp.		GOMPHIDAE			Potamyia sp.
HEPTAGENIIDAE		Argemphus sp.			HYDROPTILIDAE
Epeorus sp.		Gomphus sp.			Hydroptila sp.
Leucrocota sp.		Hagenius sp.			Leucotrichia sp.
Stenacron sp.		Lanthus sp.			Ochrotrichia sp.
Stenonema sp.		Stylogomphus sp.			LEPIDOSTOMATIDAE
LEPTOPHLEBIDAE		LIBELLULIDAE			Lepidostoma sp.
Leptophlebia sp.		MACROMIIDAE			LEPTOCERIDAE
Habrophlebia sp.		Macromia sp.			Trienodes sp.
Habrophlebiodes sp.		PETALURIDAE			Ceraclea sp.
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies			Oecetis sp.
NEOEPHEMERIDAE		CALOPTERYGIDAE			LIMNIPHILIDAE
OLIGONEURIDAE		Calopteryx sp.			Apatina sp.
Isosychia sp.		COENAGRIONIDAE			Hydatophylax sp.
POLYMITARCYIDAE		Argia sp.			Ironoquia sp.
POTAMANTHIDAE		LESTIDAE			Pycnopsyche sp.
SIPHONURIDAE		OLIGOCHAETA - Oligochaete Worms			MOLANNIDAE
Siphonurus sp.		OLIGOCHAETA FAMILY #1	1		Molanna sp.
TRICORYTHIDAE		LUMBRICIDAE			ODONTOCERIDAE
Tricorythodes sp.		ENCHYTRAEIDAE			Psilotreta sp.
GASTROPODA - Snails		NAIDIDAE			PHILOPOTAMIDAE
ANCYLIDAE		TUBIFICIDAE	3		Chimarra sp.
Ferissa sp.		LUMBRICULIDAE			Wormaldia sp.
HYDROBIIDAE	8	POLYCHAETA - Polychaete Worms			PHRYGANEIDAE
LYMNAEIDAE		AELOSOMATIDAE			Ptilostomis sp.
Fossaria sp.		Aeolosoma sp.			POLYCENTROPIDAE
Stagnicola sp.		PLECOPTERA - Stonefly Larvae			Cymellus sp.
Pseudosuccinea sp.		PERLIDAE			Polycentropus sp.
PHYSIDAE		Acroneuria sp.			PSYCHOMYIDAE
Physella sp.		Beloneuria sp.			Lype sp.
PLANORBIDAE		Eccoptura sp.			Psychomyia sp.
Menetus sp.		Neoperla sp.			RHYACOPHILIDAE
Gyraulus sp.		Perlesta sp.			Ryacophila sp.
PLEUROCERIDAE		Perinella sp.			UENOIDAE
VIVIPARIDAE		PERLODIDAE			Neophylax sp.
Viviparus sp.		Cloperla sp.			TUBELLARIA - Flatworms
HAPLOSCLERIDA		Diploperla sp.			PLANARIIDAE
SPONGILLIDAE		Isoperla sp.			DENDROCOELIDAE
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		PTERONARCYIDAE			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		PELTOPERLIDAE			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		LEUCTRIDAE			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealuctra sp.			
HEBRIDAE		Paraluctra sp.			
HYDROMETRIDAE		CAPNIDAE			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		NEMOURIDAE			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp.			
		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	7-A	BNR/BAA	1	125
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
10/25/2007	8/3/2007	SDS	MHK	32	104
BIVALVIA - Clams		Forcipomya sp.			Synorthocladus sp.
SPHAERIDAE	4	Probezia sp.			Thienemanniella sp.
Sphaerium sp.		Sphaeromias sp.			Tvetenia sp.
Pisidium sp.		Stilobezzia sp.			Unniella sp.
Musculium sp.		CHAOBORIDAE			Xylotopus sp.
CORBICULIDAE		Chaborus sp.			Zalutschia sp.
Corbicula fluminea sp.		CHIRONOMIDAE	44		Tanypodinae
UNIONIDAE		Chironominae			Ablabesmyia sp.
BRANCHIOBELLELLIDA		Chironomini			Alotanypus sp.
BRANCHIOBELLELLIDAE		Chironomus sp.			Apsectrotanypus sp.
TETRASTEMMATIDAE		Cryptochironomus sp.			Cinctotanypus sp.
COLEOPTERA - Beetles		Cryptotendipes sp.			Conchapelopia sp.
CANTHERIDAE		Demicrochironomus sp.			Guttitropia sp.
CURCULIONIDAE		Dicrotendipes sp.			Krenopelopia sp.
DRYOPIDAE		Einfeldia sp.			Labrundinia sp.
Helichus sp.		Endochironomus sp.			Larsia sp.
DYTISCIDAE	2	Glyptotendipes sp.			Macropelopia sp.
Agabus sp.		Kiefferulus sp.			Meropelopia sp.
Hydroporus sp.		Microtendipes sp.			Paramerina sp.
Coptotomus sp.		Nitthauma sp.			Pentaneura sp.
Oreodytes sp.		Pagastella sp.			Procladius sp.
Laccornis sp.		Parachironomus sp.			Psectrotanypus sp.
Dytiscus sp.		Paracladopelma sp.			Rheopelopia sp.
ELMIDAE		Paratendipes sp.			Tanypus sp.
Microcylopeus sp.		Phaenopsectra sp.			Thienemannimyia gp.
Optioservus sp.		Polypedium sp.			Thienemannimyia sp.
Stenelmis sp.		Stenochironomus sp.			Trissopelopia sp.
Promoresia sp.		Stictochironomus sp.			Zavrelimyia sp.
Macronychus sp.		Tribelos sp.			CULICIDAE
Dubiraphia sp.		Zavrelia sp.			Aedes
Ancyronyx sp.		Tanytarsini			Anopheles
Oulimnius sp.		Cladotanytarsus sp.			Culex
GYRINIDAE		Constempellina sp.			Culiseta
Dineutus		Microsestra sp.			Mansonia
Gyrinus		Microsestra/Tanytarsus complex			Orthopodomia
HALIPIDAE		Paratanytarsus sp.			Psorophora
Halipus sp.		Rheotanytarsus sp.			Toxorhynchites
HYDROPHILIDAE		Stempellina sp.			Uranotaenia
Cymbiodyta sp.		Stempellinella sp.			Wyeomyia
Berosus sp.		Sublettea sp.			DIXIDAE
Derallus sp.		Tanytarsus sp.			Dixa sp.
Helochaeres sp.		Zavrelia sp.			DOLICHOPODIDAE
Helophorus sp.		Diamesinae			EMPIDIDAE
Hydrophilus sp.		Diamesa sp.			Chelifera sp.
Hydrochus sp.		Pagastia sp.			Clinocera sp.
Tropisternus sp.		Pothastia sp.			Hemerodromia sp.
Hydrobius sp.		Prodiamesa sp.			Dolichocephala sp.
Laccobius sp.		Symphothastia sp.			EPHYRIDAE
PSEPHENIDAE		Orthocladinae			PELCOHRHYNCHIDAE
Psephenus sp.		Brillia sp.			Glutops sp.
Ectopria sp.		Cardiocladius sp.			PSYCHODIDAE
Dicranopelaphus sp.		Chaetocladius sp.			Pericoma sp.
PTILODACTYLIDAE		Corynoneura sp.			Psychoda sp.
Anchytarsus sp.		Cricotopus sp.			SIMULIDAE
COPEPODA		Cricotopus/Orthocladus sp.			Simulium sp.
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.			Prosimulium sp.
CRANGONYCTIDAE	3	Eukiefferiella sp.			Cnephia sp.
Stygonectes sp.		Heleniella sp.			Twinia sp.
Crangonyx sp.		Heterotrissocladius sp.			Stegopterna sp.
Synurella sp.		Hydrobaenus sp.			Ecternia sp.
GAMMARIDAE		Limnophyes sp.			STRATIOMYIDAE
Gammarus sp.		Lopescladius sp.			Oxycera sp.
HYALELLIDAE		Mesocricotopus sp.			Odontomyia sp.
Hyalella sp.		Mesosmittia sp.			SYRPHIDAE
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.			Chrysogaster sp.
CAMBARIDAE		Orthocladinae A			Eristalis sp.
PALAEONIDAE		Orthocladus sp.			TABANIDAE
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.			Chrysops sp.
ASELIDAE		Parakiefferiella sp.			Tabanus sp.
Caecidotea sp.		Parametricnemus sp.			TANYDERIDAE
Lirceus sp.		Paraphaenocladus sp.			THAUMALEIDAE
DIPTERA - True Flies		Parasmittia sp.			Thaumalea sp.
ATHERICIDAE		Paratrichocladius sp.			TIPULIDAE
Atherix sp.		Paratrisocladius sp.			Antocha sp.
BLEPHARICERIDAE		Psectrocladius sp.			Hexatoma sp.
CECIDOMYIIDAE		Pseudorthocladus sp.			Leptotarsus sp.
CERATOPOGONIDAE		Paiometricnemus sp.			Molophilus sp.
Alluaudomyia sp.		Rheocricotopus sp.			Tipula sp.
Bezzia sp.		Rheosmittia sp.			Pseudolimnophila sp.
Ceratopogon sp.		Smittia sp.			Dicranota sp.
Culicoides sp.		Stilocladius sp.			Limnophila sp.
Dasyhelea sp.		Symposiocladius sp.			Ormosia sp.
					Diptera sp.
					CULICIDAE
					1

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	7-A	BNR/BAA	1	125
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
10/25/2007	8/3/2007	SDS	MHK	32	104
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostola sp.	
Pilaria sp.		HOPLOMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archana sp.		TAenioPTERGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Gaddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centropilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaesha sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Euryphlebia sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocota sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trianaodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclaea sp.	
Paraleptophlebia sp.		ODONATA (Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNephilIDAE	1
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms		MOLANNIDAE	
Siphonurus sp.		LUMBRICIDAE		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAELIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Pallotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE	43	PHILOPOTAMIDAE	2
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormaldia sp.	
HYDROBIIDAE		AEOLOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aelosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acronuria sp.		Polycentropus sp.	
PHYSIDAE		Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccoctura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlesta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perlinella</i> sp.		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	1
VIVIPARIDAE		Cloperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE	3		
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	8-A	BNR/BAA	1	136
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/26/2007-11/27/2007	7/17/2007	BNR	MHS	11	127
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE		Probezia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	107	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Aspectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicroptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nitthauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracodiopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
Optioservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promesia sp.		Stictochironomus sp.		Zavelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubirapha sp.		Zaveliella sp.		Aedes	
Anoxyonyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropsectra sp.		Mansonia	
Gyrinus		Micropsectra/Tanytarsus complex		Orthopodomya	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodya sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chellera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Symphosthia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthoclaudiinae		PELCOHYDRIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
GAMMARIDAE	2	Eukiefferiella sp.		Cnephia sp.	
CRANGONYCTIDAE		Heleniella sp.		Twinnia sp.	
Stygonectes sp.		Heterotrissocladus sp.		Stegopterna sp.	
Crangonyx sp.		Hydrobaenus sp.		Ecternia sp.	
Synurella sp.		Limnophyes sp.		STRATIOMYIDAE	
GAMMARIDAE		Lopescladius sp.		Oxycera sp.	
Gammurus sp.		Mesocricotopus sp.		Odontomyia sp.	
HYALELLIDAE		Mesosmittia sp.		SYRPHIDAE	
Hyalella sp.		Nanocladus sp.		Chrysogaster sp.	
CRUSTACEA (Decapoda - Crayfish)		Orthocladinae A		Eristella sp.	
CAMBARIDAE		Orthocladus sp.		TABANIDAE	
PALAEONIDAE		Parachaetocladius sp.		Chrysops sp.	
CRUSTACEA (Isopoda - Sowbugs)		Parakiefferiella sp.		Tabanus sp.	
ASELIDAE	1	Parametrioctenium sp.		TANYDERIDAE	
Caecidotea sp.		Paraphaenocladus sp.		THAUMALEIDAE	
Lirceus sp.		Parasmittia sp.		Thaumalea sp.	
DIPTERA - True Flies		Paratrichocladus sp.		TIPULIDAE	1
ATHERICIDAE		Paratrichocladus sp.		Antocha sp.	
Atherix sp.		Psectrocladius sp.		Hexatoma sp.	
BLEPHARICERIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CECIDOMYIIDAE		Psielometrioctenium sp.		Molophilus sp.	
CERATOPOGONIDAE		Rheocricotopus sp.		Tipula sp.	
Alluaudomyia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Bezzia sp.		Smittia sp.		Dicranota sp.	
Ceratopogon sp.		Stilocladus sp.		Limnophila sp.	
Culicoides sp.		Symposiocladius sp.		Ormosia sp.	
Dasyhelea sp.					

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	8-A	BNR/BAA	1	136
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/26/2007-11/27/2007	7/17/2007	BNR	MHS	11	127
Pedicia sp.		Microvelia sp.			Paranemoura sp.
Limonia sp.		HIRUDINEA - Leeches			Prostoia sp.
Pilaria sp.		HOPLOMERTEA - Ribbon Worms			Shipsa sp.
Eniptera sp.		TETRASTEMMATIDAE			CHLOROPERLIDAE
Rhabdomastix sp.		Prostoma sp.			Alloperla sp.
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae			Haploperla sp.
Trichocera sp.		NOCTUIDAE			Sweltsa sp.
EPHEMEROPTERA - Mayflies		Archana sp.			TAENIOPTERIGIDAE
AMELETIDAE		Ballura sp.			Strophopteryx sp.
Ameletus sp.		PYRALIDAE			Taeniopteryx sp.
BAETIDAE		MEGALOPTERA - Dobsonflies			TRICHOPTERA - Caddisflies
Acentrella sp.		CORYDALIDAE			BRACHYCENTRIDAE
Acerpenna sp.		Chauliodes sp.			Brachycentrus sp.
Baetis sp.		Corydalis sp.			CALAMOCERATIDAE
Centropetium sp.		Nigronia sp.			Heteroplectron sp.
Dipheter sp.		SIALIDAE			DIPSEUDOPSIDAE
BAETISCIDAE		Sialis sp.			Phylocentropus sp.
Baetisca sp.		NEMATODA - Roundworms			GLOSSOSOMATIDAE
CAENIDAE		NEMATOMORPHA - Horsehair Worms			Glossosoma sp.
Caenis sp.		ODONATA (Anisoptera - Dragonflies)			Agapetus sp.
EPHEMERELLIDAE		AESHNIDAE			HELICOPSYCHIDAE
Dannella sp.		Anax sp.			Helicopsyche sp.
Drunella sp.		Basiaesha sp.			HYDROPSYCHIDAE
Ephemerella sp.		Boyeria sp.			Cheumatopsyche sp.
Eurylophella sp.		CORDULEGASTRIDAE			Dipterona sp.
Serratella sp.		Cordulegaster sp.			Hydropsyche sp.
EPHEMERIDAE		CORDULIDAE			Parapsyche sp.
Ephemera sp.		GOMPHIDAE			Potamyia sp.
HEPTAGENIIDAE		Argemphus sp.			HYDROPTILIDAE
Epeorus sp.		Gomphus sp.			Hydroptila sp.
Leucocuta sp.		Hagenius sp.			Leucotrichia sp.
Stenacron sp.		Lanthus sp.			Ochrotrichia sp.
Stenonema sp.		Stylogomphus sp.			LEPIDOSTOMATIDAE
LEPTOPHLEBIIDAE		LIBELLULIDAE			Lepidostoma sp.
Leptophlebia sp.		MACROMIDAE			LEPTOCERIDAE
Habrophlebia sp.		Macromia sp.			Trianaodes sp.
Habrophlebiodes sp.		PETALURIDAE			Ceractea sp.
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)			Oecetis sp.
NEOEPHEMERIDAE		CALOPTERYGIDAE			LIMNephilidae
OLIGONEURIDAE		Calopteryx sp.			Apatina sp.
Isomychia sp.		COENAGRIONIDAE			Hydatophylax sp.
POLYMITARCYIDAE		Argia sp.			Ironoquia sp.
POTAMANTHIDAE		LESTIDAE			Pycnopsyche sp.
SIPHONEURIDAE		OLIGOCHAETA - Oligochaete Worms			MOLANNIDAE
Siphonurus sp.		LUMBRICIDAE	5		Molanna sp.
TRICORYTHIDAE		ENCHYTRAEIDAE			ODONTOCERIDAE
Tricorythodes sp.		NAIDIDAE			Psilotreta sp.
GASTROPODA - Snails		TUBIFICIDAE	10		PHILOPOTAMIDAE
ANCYLIDAE		LUMBRICULIDAE			Chimarra sp.
Ferissa sp.		POLYCHAETA - Polychaete Worms			Wormaldia sp.
HYDROBIIDAE		AELOSOMATIDAE			PHRYGANEIDAE
LYMNAEIDAE		Aelosoma sp.			Ptilostomis sp.
Fossaria sp.		PLECOPTERA - Stonefly Larvae			POLYCENTROPIDAE
Slagmcola sp.		PERLIDAE			Cymellus sp.
Pseudosuccinea sp.		Acroneuria sp.			Polycentropus sp.
PHYSIDAE		Beloneuria sp.			PSYCHOMYIDAE
Physella sp.		Eccoptera sp.			Lype sp.
PLANORBIDAE		Neoperla sp.			Psychomyia sp.
Menetus sp.		Perlenta sp.			RHYACOPHILIDAE
Gyraulus sp.		<i>Perinella</i> sp.			Ryacophila sp.
PLEUROCERIDAE		PERLODIDAE			UENOIDAE
VIVIPARIDAE		Cloperla sp.			Neophylax sp.
Viviparus sp.		Diploperla sp.			PLATYHELMINTHES
HAPLOSCLERIDA		Isoperla sp.			TUBELLARIA - Flatworms
SPONGILLIDAE		Cultus sp.			PLANARIIDAE
HEMIPTERA - True Bugs		PTERONARCYIDAE			DENDROCOELIDAE
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Tropobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELLIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Nanatra sp.		Ostrocerca sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	9-A	BNR/BAA	1	125
Date ID'd	Date Sorted	Taxononomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/26/2007	9/28/2007	JAB	MHS	10	127
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE	1	Probezia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	121	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Aspectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicroptochironomus sp.		Guttipolopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nitohauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcylopus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
Optioservus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarasini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanyarsus complex		Orthopodomyla	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Symphothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthoclaudiinae		PELICORHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANGONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladus sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrichocladus sp.		TIPULIDAE	
Atherix sp.		Paratrisocladus sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psilometriocnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladus sp.		Limnophila sp.	
Dasyhelea sp.		Symphocicladus sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run	20010	9-A	BNR/BAA	1	125
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
11/26/2007	9/28/2007	JAB	MHS	10	127
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLOMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERA		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Swelta sp.	
EPHEMEROPTERA - Mayflies		Archana sp.		TAENIOPTERIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalis sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Stalis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaesha sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Euryophelia sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocuta sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthis sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trienodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNIPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	2	MOLANNIDAE	
Siphonurus sp.		LUMBRICIDAE		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAEIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE	3	PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormaldia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aelosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acroneuria sp.		Polycentropus sp.	
PHYSIDAE		Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccoptera sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlesta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perlina</i> sp.		Ryacophila sp.	
PLEURO CERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Cloperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

Exhibit 6



EXHIBIT 6: HABITAT ASSESSMENT FIELD DATA SHEET - SUMMARY WORKSHEET

Project Name and WSSI Number: Northern Virginia Stream Restoration Bank: Colvin Run (WSSI # 20010)	
Stream ID: Colvin Run and Unnamed Tributaries to Colvin Run	Date: 4/18/07-4/20/07
Evaluators: SDS/BNR/AMC/BAA	
HUC: 02070008	
Assessment Period:	Prerestoration Postrestoration

Assessment Reach Name	Condition Category										TOTAL SCORE	Percent of Best Possible Score	Reach Length	Stream Type	
	Substrate	Embedded-ness	Velocity	Sediment Deposition	Flow Status	Channel Alteration	Frequency of Riffles	Bank Stability*	Vegetation Protection*	Riparian Zone*					
Stream 1	1-A	Suboptimal	Suboptimal	Suboptimal	Marginal	Optimal	Optimal	Optimal	Suboptimal	Optimal	Optimal	Optimal	Optimal	300	R3
Stream 2	2-A	Poor	Poor	Marginal	Marginal	Optimal	Optimal	Optimal	Poor	Optimal	Optimal	Optimal	Optimal	300	R3
	2-B	Suboptimal	Suboptimal	Marginal	Marginal	Poor	Poor	Optimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Optimal	300	R3
Stream 3	3-A	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Optimal	Optimal	Optimal	Optimal	300	R3
Stream 4	4-A	Marginal	Marginal	Suboptimal	Marginal	Marginal	Marginal	Optimal	Marginal	Optimal	Optimal	Optimal	Optimal	300	R3
Stream 5	5-A	Marginal	Marginal	Marginal	Marginal	Optimal	Optimal	Optimal	Marginal	Optimal	Optimal	Optimal	Optimal	300	R3
Stream 6	6-A	Poor	Poor	Marginal	Poor	Suboptimal	Suboptimal	Optimal	Poor	Optimal	Optimal	Optimal	Optimal	300	R4
Stream 7	7-A	Poor	Poor	Marginal	Poor	Marginal	Marginal	Optimal	Poor	Suboptimal	Suboptimal	Optimal	Optimal	300	R3
Stream 8	8-A	Marginal	Suboptimal	Poor	Optimal	Suboptimal	Poor	Optimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Optimal	300	R4
Stream 9	9-A	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Optimal	Optimal	Optimal	Optimal	300	R4
Total											148	74	300	R4	
Total											145	73	300	R3	
Total											121	61	300	R3	
Total											129	65	300	R3	
Total											122	61	300	R3	
Total											113	57	300	R4	
Total											86	43	300	R3	
Total											123	62	300	R4	
Total											148	74	300	R4	
Total											148	74	3,000		

* The score for Bank Stability, Vegetation Protection and Riparian Zone combines the left and right bank scores.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		4/18/2007	N/A
Investigators		HUC	Potomac	Locality	
BNR/BAA		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-A		156	300	1	
Latitude	Longitude	Stream Name			
38°59'9"	77°19'11"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Total Score					56

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS						
Project #	Site	Cowardin	River Basin	Date	Time	
20010	NOVA Stream Bank	R3	Potomac	4/18/2007	N/A	
Investigators		HUC		Locality		
BNR/BAA		02070008	Fairfax County			
Reach		D.A. (Acres)	Reach Length (LF)	Order		
1-A		156	300	1		
Latitude	Longitude	Stream Name				
38°59'9"	77°19'11"	Unnamed Tributary to Colvin Run				
Habitat Parameter	Condition Category					
	Optimal	Suboptimal	Marginal	Poor	Score	
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	20	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6		5 4 3 2 1 0
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstructions is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	17	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6		5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	7	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3		2 1 0
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3		2 1 0
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	9	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3		2 1 0
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3		2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	10	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3		2 1 0
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3		2 1 0
Total Score					145	

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		12/19/2007	N/A
Investigators		HUC	Potomac	Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
2-A		174	300	1	
Latitude	Longitude	Stream Name			
38°57'58"	77°19'27"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Total Score					33

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS						
Project #	Site	Cowardin	River Basin	Date	Time	
20010	NOVA Stream Bank	R3		12/19/2007	N/A	
Investigators		HUC	Potomac	Locality		
SDS/AMC		02070008		Fairfax County		
Reach		D.A. (Acres)	Reach Length (LF)	Order		
2-A		174	300	1		
Latitude	Longitude	Stream Name				
38°57'58"	77°19'27"	Unnamed Tributary to Colvin Run				
Habitat Parameter	Condition Category					
	Optimal	Suboptimal	Marginal	Poor	Score	
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.		
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	19
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.		
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	19
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.		
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants alive	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.		
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.		
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					95	

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		4/20/2007	N/A
Investigators		HUC	Potomac	Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
2-B		100	300	1	
Latitude	Longitude	Stream Name			
38°58'14"	77°19'44"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Total Score					53

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		4/20/2007	N/A
Investigators		HUC	Potomac	Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
2-B		100	300	1	
Latitude	Longitude	Stream Name			
38°58'14"	77°19'44"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	6
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					121

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		4/18/2007	N/A
Investigators		HUC	Potomac	Locality	
BNR/BAA		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
3-A		703	300	2	
Latitude	Longitude	Stream Name			
38°57'23"	77°19'51"	Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
	Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
	Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
	Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Total Score					69

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS						
Project #	Site	Cowardin	River Basin	Date	Time	
20010	NOVA Stream Bank	R3	Potomac	4/18/2007	N/A	
Investigators		HUC		Locality		
BNR/BAA		02070008	Fairfax County			
Reach		D.A. (Acres)	Reach Length (LF)	Order		
3-A		703	300	2		
Latitude	Longitude	Stream Name				
38°57'23"	77°19'51"	Colvin Run				
Habitat Parameter	Condition Category					
	Optimal	Suboptimal	Marginal	Poor	Score	
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	20	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6		5 4 3 2 1 0
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	18	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6		5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	6	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3		2 1 0
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3		2 1 0
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	9	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3		2 1 0
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3		2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	10	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3		2 1 0
	<i>Score Right Bank</i>	10 9	8 7 6	5 4 3		2 1 0
Total Score					157	

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		4/18/2007	N/A
Investigators		HUC	Potomac	Locality	
BNR/BAA		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
4-A		245	300	1	
Latitude	Longitude	Stream Name			
38°57'43"	77°19'53"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	10
Total Score					48

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		4/18/2007	N/A
Investigators		HUC	Potomac	Locality	
BNR/BAA		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
4-A		245	300	1	
Latitude	Longitude	Stream Name			
38°57'43"	77°19'53"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.		
20					
7. Frequency of Riffles Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.		
17					
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.		
3					
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	3
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream. More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.		
9					
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone) Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.		
10					
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
<i>Total Score</i>					129

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		4/20/2007	N/A
Investigators		HUC	Potomac	Locality	
BNR/BAA		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
5-A		75	300	2	
Latitude	Longitude	Stream Name			
38°57'55"	77°19'56"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	7
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
Total Score					40

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		4/20/2007	N/A
Investigators		HUC	Potomac	Locality	
BNR/BAA		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
5-A		75	300	2	
Latitude	Longitude	Stream Name			
38°57'55"	77°19'56"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	4
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					122

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4	Potomac	4/20/2007	N/A
Investigators		HUC		Locality	
BNR/BAA		02070008	Fairfax County		
Reach		D.A. (Acres)	Reach Length (LF)	Order	
6-A		6	300	1	
Latitude	Longitude	Stream Name			
38°57'58"	77°19'55"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	3
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	3
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	8
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	4
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	15
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	
Total Score					33

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		4/20/2007	N/A
Investigators		HUC	Potomac	Locality	
BNR/BAA		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
6-A		6	300	1	
Latitude	Longitude	Stream Name			
38°57'58"	77°19'55"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.		
	20				
7. Frequency of Riffles Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.		
	18				
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.		
<i>Score Right Bank</i> 10 9 8 7 6 5 4 3 2 1 0	2				
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream. More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.		
<i>Score Right Bank</i> 10 9 8 7 6 5 4 3 2 1 0	9				
10. Riparian Vegetative Zone Width (score each bank riparian zone) Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.		
<i>Score Right Bank</i> 10 9 8 7 6 5 4 3 2 1 0	10				
Total Score					113

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		4/20/2007	N/A
Investigators		HUC		Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
7-A		44	300	1	
Latitude	Longitude	Stream Name			
38°58'22"	77°20'21"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	1
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	2
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	2
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
Total Score					19

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3	Potomac	4/20/2007	N/A
Investigators		HUC		Locality	
SDS/AMC		02070008	Fairfax County		
Reach		D.A. (Acres)	Reach Length (LF)	Order	
7-A		44	300	1	
Latitude	Longitude	Stream Name			
38°58'22"	77°20'21"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	20
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	11
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	1
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	
					1
					1
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	7
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	
					7
					7
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	10
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	
					10
					10
Total Score					86

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		4/20/2007	N/A
Investigators		HUC	Potomac	Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
8-A		48	300	2	
Latitude	Longitude	Stream Name			
38°58'1"	77°20'44"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Total Score					57

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		4/20/2007	N/A
Investigators		HUC	Potomac	Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
8-A		48	300	2	
Latitude	Longitude	Stream Name			
38°58'1"	77°20'44"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	6
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	7
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					123

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		4/18/2007	N/A
Investigators		HUC	Potomac	Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
9-A		67	300	1	
Latitude	Longitude	Stream Name			
38°58'13"	77°20'49"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	12
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	14
Total Score					61

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		4/18/2007	N/A
Investigators		HUC	Potomac	Locality	
SDS/AMC		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
9-A		67	300	1	
Latitude	Longitude	Stream Name			
38°58'13"	77°20'49"	Unnamed Tributary to Colvin Run			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	20
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	17
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	7
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	7
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					148

Exhibit 7

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET								
Project #	Site	Cowardin	River Basin	Date	Time			
20010	Colvin	R3	Potomac	4/18/2007	N/A			
Investigators		HUC		Locality				
BNR/BAA		2070008		Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)		Order			
1-A		156	300		1			
Latitude	Longitude	Stream Name						
38°58'9"	77°19'11"	Unnamed Tributary to Colvin Run						
Habitat Types (Indicate Percentage of Each Habitat Present)								
Cobble	40	Sand	0	Rootwads	40	Vegetated Banks	0	
Submerged Macrophytes		0	Undercut Banks		20	Other		20
Sample Collection								
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat				
D-Frame	x	Wading		x				
Kick-Net		From Bank		Cobble	7	Undercut Banks	4	
Other		From Boat		Sand	0	Submerged Macrophytes	0	
				Rootwads	5			
				Vegetated Banks	0	Other	4	
General Comments								
Qualitative Listing of Aquatic Biota								
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant								
Periphyton		3	Slimes		1			
Filamentous Algae		2	Macroinvertebrates		3			
Macrophytes		0	Fish		2			
Page 1 of 1								

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20010	Colvin	R3	Potomac	4/20/2007	N/A		
Investigators		HUC	Locality				
SDS/AMC		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
2-A		174	300	1			
Latitude	Longitude	Stream Name					
38°57'58"	77°19'27"	Unnamed Tributary to Colvin Run					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	75	Sand	0	Rootwads	0	Vegetated Banks	0
Submerged Macrophytes		0	Undercut Banks		30	Other	0
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
D-Frame	x	Wading		x			
Kick-Net		From Bank		Cobble	16	Undercut Banks	4
Other		From Boat		Sand	0	Submerged Macrophytes	0
				Rootwads	0		
				Vegetated Banks	0	Other	0
General Comments							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		2	Slimes				0
Filamentous Algae		2	Macroinvertebrates				2
Macrophytes		0	Fish				3

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET								
Project #	Site	Cowardin	River Basin	Date	Time			
20010	Colvin	R3	Potomac	4/5/2007	N/A			
Investigators		HUC		Locality				
SDS/AMC		2070008		Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)		Order			
2-B		100	300		1			
Latitude	Longitude	Stream Name						
38°58'14"	77°19'44"	Unnamed Tributary to Colvin Run						
Habitat Types (Indicate Percentage of Each Habitat Present)								
Cobble	90	Sand	40	Rootwads	1	Vegetated Banks	1	
Submerged Macrophytes		0	Undercut Banks		1	Other		0
Sample Collection								
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat				
D-Frame	x	Wading		x				
Kick-Net		From Bank		Cobble	16	Undercut Banks	0	
Other		From Boat		Sand	0	Submerged Macrophytes	0	
				Rootwads	0			
				Vegetated Banks	0	Other	0	
General Comments								
Qualitative Listing of Aquatic Biota								
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant								
Periphyton		2	Slimes		0			
Filamentous Algae		2	Macroinvertebrates		2			
Macrophytes		0	Fish		2			
Page 1 of 1								

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET								
Project #	Site	Cowardin	River Basin	Date	Time			
20010	Colvin	R3	Potomac	4/20/2007	N/A			
Investigators		HUC		Locality				
BNR/BAA		2070008		Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)		Order			
3-A		703	300		2			
Latitude		Longitude		Stream Name				
38°57'23"		77°21'01"		Colvin Run				
Habitat Types (Indicate Percentage of Each Habitat Present)								
Cobble	60	Sand	0	Rootwads	20	Vegetated Banks	0	
Submerged Macrophytes		0	Undercut Banks		30	Other		10
Sample Collection								
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat				
D-Frame	x	Wading		x				
Kick-Net		From Bank		Cobble	8	Undercut Banks	5	
Other		From Boat		Sand	0	Submerged Macrophytes	0	
				Rootwads	5			
				Vegetated Banks	0	Other	1	
General Comments								
Qualitative Listing of Aquatic Biota								
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant								
Periphyton		2	Slimes		1			
Filamentous Algae		2	Macroinvertebrates		3			
Macrophytes		2	Fish		1			
Page 1 of 1								

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20010	Colvin	R3	Potomac	4/18/2007	N/A		
Investigators		HUC	Locality				
BNR/BAA		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
4-A		245	300	1			
Latitude	Longitude	Stream Name					
38°57'43"	77°19'53"	Unnamed Tributary to Colvin Run					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	80	Sand	0	Rootwads	10	Vegetated Banks	0
Submerged Macrophytes		0	Undercut Banks		20	Other	5
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
D-Frame	x	Wading		x			
Kick-Net		From Bank		Cobble	11	Undercut Banks	4
Other		From Boat		Sand	0	Submerged Macro-phytes	0
				Rootwads	2		
				Vegetated Banks	0	Other	3
General Comments							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		2	Slimes		0		
Filamentous Algae		1	Macroinvertebrates		2		
Macrophytes		0	Fish		2		
Page 1 of 1							

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET								
Project #	Site	Cowardin	River Basin	Date	Time			
20010	Colvin	R3	Potomac	4/20/2007	N/A			
Investigators		HUC		Locality				
BNR/BAA		2070008		Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)		Order			
5-A		75	300		2			
Latitude	Longitude	Stream Name						
38°57'55"	77°19'56"	Unnamed Tributary to Colvin Run						
Habitat Types (Indicate Percentage of Each Habitat Present)								
Cobble	50	Sand	0	Rootwads	10	Vegetated Banks	0	
Submerged Macrophytes		0	Undercut Banks		30	Other		10
Sample Collection								
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat				
D-Frame	x	Wading		x				
Kick-Net		From Bank		Cobble	13	Undercut Banks	3	
Other		From Boat		Sand	0	Submerged Macrophytes	0	
				Rootwads	3			
				Vegetated Banks	0	Other	1	
General Comments								
Qualitative Listing of Aquatic Biota								
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant								
Periphyton		1	Slimes		0			
Filamentous Algae		1	Macroinvertebrates		3			
Macrophytes		0	Fish		1			
Page 1 of 1								

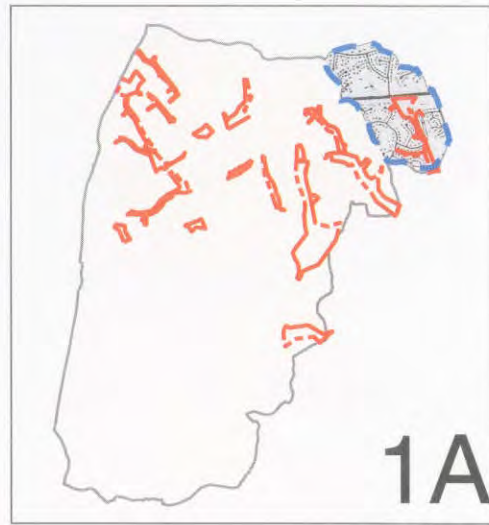
WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET												
Project #	20010	Site	Colvin	Cowardin	R4	River Basin	Potomac	Date	4/20/2007	Time	N/A	
Investigators				HUC		Locality						
BNR/BAA				2070008		Fairfax County						
Reach				D.A. (Acres)		Reach Length (LF)		Order				
6-A				6		300		1				
Latitude		Longitude		Stream Name								
38°57'58"		77°19'55"		Unnamed Tributary to Colvin Run								
Habitat Types (Indicate Percentage of Each Habitat Present)												
Cobble	80	Sand	0	Rootwads	0	Vegetated Banks	0					
Submerged Macrophytes			0	Undercut Banks		40	Other		1			
Sample Collection												
Gear Used		How Were Samples Collected?				Number of Jabs/Kicks Taken from Each Habitat						
D-Frame	x	Wading		x								
Kick-Net		From Bank				Cobble	17	Undercut Banks	3			
Other		From Boat				Sand	0	Submerged Macrophytes	0			
						Rootwads	0					
						Vegetated Banks	0					Other
General Comments												
Qualitative Listing of Aquatic Biota												
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant												
Periphyton				0	Slimes				0			
Filamentous Algae				1	Macroinvertebrates				2			
Macrophytes				0	Fish				0			
Page 1 of 1												

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET								
Project #	Site	Cowardin	River Basin	Date	Time			
20010	Colvin	R3	Potomac	4/20/2007	N/A			
Investigators		HUC		Locality				
SDS/AMC		2070008		Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)		Order			
7-A		44	300		1			
Latitude		Longitude		Stream Name				
38°58'22"		77°20'21"		Unnamed Tributary to Colvin Run				
Habitat Types (Indicate Percentage of Each Habitat Present)								
Cobble	40	Sand	50	Rootwads	1	Vegetated Banks	0	
Submerged Macrophytes		0	Undercut Banks		1	Other		60
Sample Collection								
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat				
D-Frame	x	Wading		x				
Kick-Net		From Bank		Cobble	13	Undercut Banks	1	
Other		From Boat		Sand	0	Submerged Macrophytes	0	
				Rootwads	5			
				Vegetated Banks	0	Other	0	
General Comments								
Qualitative Listing of Aquatic Biota								
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant								
Periphyton		0	Slimes		0			
Filamentous Algae		0	Macroinvertebrates		1			
Macrophytes		0	Fish		0			
Page 1 of 1								

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20010	Colvin	R4	Potomac	4/20/2007	N/A		
Investigators		HUC		Locality			
SDS/AMC		2070008		Fairfax County			
Reach		D.A. (Acres)	Reach Length (LF)		Order		
8-A		48	300		2		
Latitude		Longitude		Stream Name			
38°58'1"		77°20'44"		Unnamed Tributary to Colvin Run			
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	100	Sand	20	Rootwads	1	Vegetated Banks	0
Submerged Macrophytes		0		Undercut Banks		0	
				Other		0	
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
D-Frame	x	Wading		x			
Kick-Net		From Bank		Cobble	19	Undercut Banks	0
Other		From Boat		Sand	0	Submerged Macrophytes	0
				Rootwads	1		
				Vegetated Banks	0	Other	0
General Comments							
One salamander in net.							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		2		Slimes		0	
Filamentous Algae		2		Macroinvertebrates		1	
Macrophytes		0		Fish		0	
Page 1 of 1							

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20010	Colvin	R4	Potomac	4/18/2007	N/A		
Investigators		HUC	Locality				
SDS/AMC		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
9-A		67	300	1			
Latitude	Longitude	Stream Name					
38°58'13"	77°20'49"	Unnamed Tributary to Colvin Run					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	90	Sand	30	Rootwads	3	Vegetated Banks	35
Submerged Macrophytes			0	Undercut Banks		Other	15
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
D-Frame	x	Wading	x				
Kick-Net		From Bank		Cobble	8	Undercut Banks	6
Other		From Boat		Sand	0	Submerged Macrophytes	0
				Rootwads	1		
				Vegetated Banks	0	Other	4
General Comments							
One salamander in net							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		0	Slimes				0
Filamentous Algae		0	Macroinvertebrates				2
Macrophytes		0	Fish				0
Page 1 of 1							

Exhibit 8



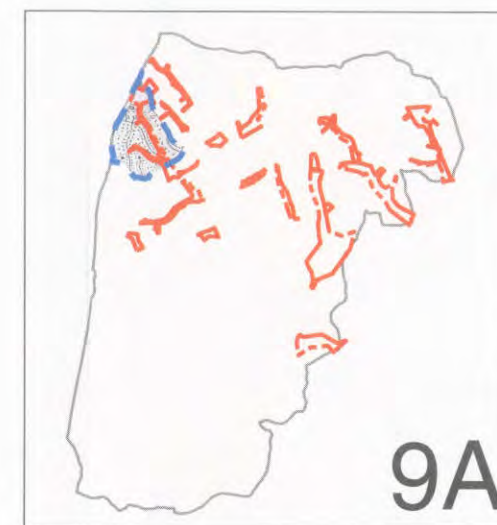
1A



3A



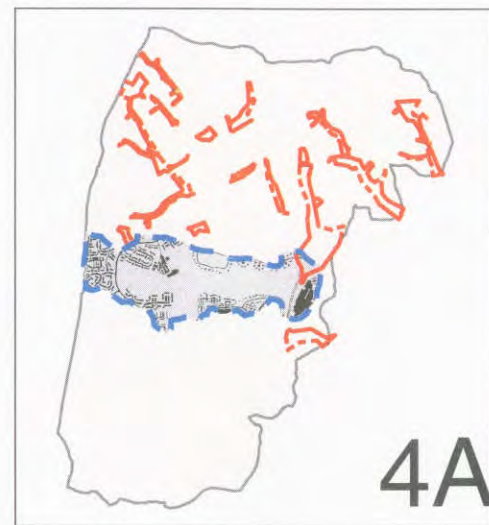
6A



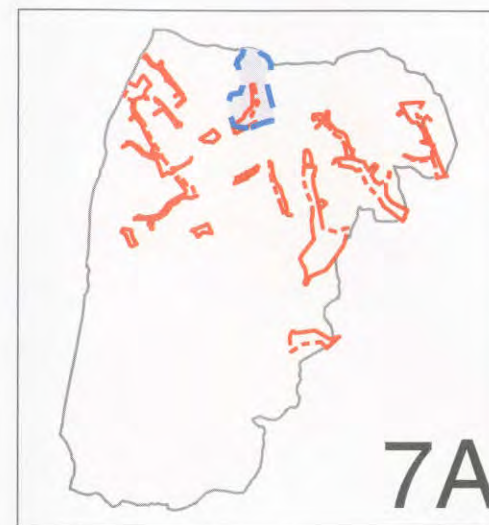
9A



2A



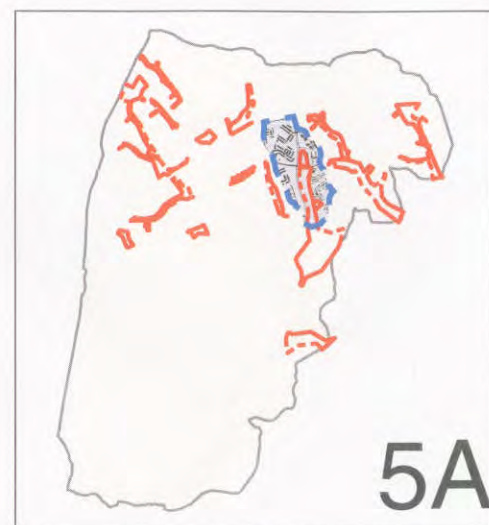
4A



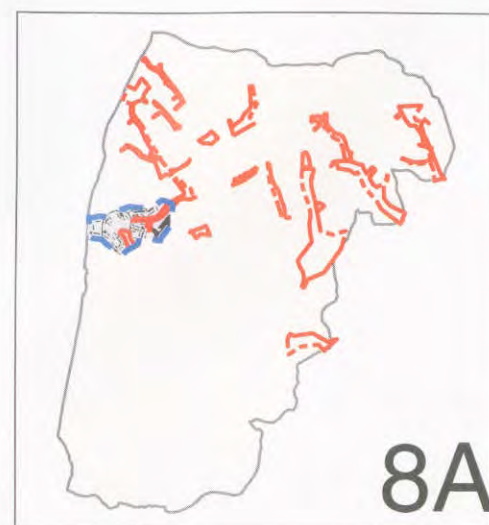
7A



2B



5A



8A



Land Cover Map
Colvin Run
Scale: 1" = 1 mile

Stream ID	Impervious Percent	Total Acres	VA-SCI
1A	22	156	20.48
2A	24	176	17.29
2B	26	100	13.14
3A	43	704	37.78
4A	25	245	15.4
5A	28	75	15.77
6A	23	5.7	28.12
7A	1.3	44	26.66
8A	29	48	14.85
9A	22	67	10.05

- SITE
- DRAINAGE BOUNDARIES
- IMPERVIOUS AREAS
- PERVIOUS AREAS