Final Report To Assess the Status of the Benthic Macroinvertebrate and Periphyton Communities Within the Vicinity of the Palmerton Zinc Pile Superfund Site, Palmerton, Carbon County, PA 2006-2007

Prepared for:

Palmerton Zinc Pile Superfund Site
Natural Resource Damage Assessment
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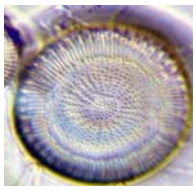

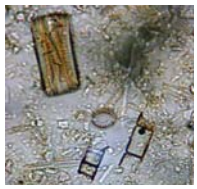

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EXECUTIVE SUMMARY

- In October 2006 and August 2007, collections of water quality, habitat, bottom substrate composition, benthic macroinvertebrate, and periphyton communities were conducted in Mill, Buckwha, and Aquashicola Creeks and the main stem Upper Lehigh River. Seventeen total sites were sampled: 10 within the tributary streams and 7 within the main stem Upper Lehigh River.

- The *in situ* water quality parameters, physical habitat conditions, and substrate composition were not thought to limit the ability of the study sites to support a healthy, balanced macroinvertebrate, periphyton, or fish community.

- The reference sites located on Buckwha Creek (BC10, BC09), and Aquashicola Creek (AC08, AC07) and additional sites on Mill Creek (MC01) and Aquashicola Creek (AC06) appeared to represent balanced macroinvertebrate, periphyton, and fish communities that were not impaired by the Palmerton Zinc Pile contaminant releases.

- AC05 was a transitional impact site while AC04, AC03/02, and AC01 represented aquatic communities under stress from a probable metals source as evidenced by the changes in species composition and function within the various aquatic communities. For example, the macroinvertebrate community below AC04 loses the mayfly fauna and there is a shift in functional feeding group structure.

- The metrics used to define the presence of stressor(s) in the Upper Lehigh River showed a slight decline in the richness type scores below the confluence with Aquashicola Creek at LR03. There appeared to be some impairment in that immediate vicinity with a metals signature because the percent hydropsychid caddisfly value sharply increased over the two upstream sites. However, the very substantial occurrence of metals sensitive mayflies complicates this assessment.

- Although surface water/sediment, macroinvertebrate tissue concentrations for selected metals, and fish tissue metals concentrations and fish community composition data were not collected as part of this study but as part of separate studies on the Site this parallel data is important to include when evaluated in the context of the results from the macroinvertebrate and algal community studies.

- Using zinc concentrations in the sediments as a surrogate for the suite of heavy metals present in the tributary streams, the results show a close association between zinc concentrations and the presence of metals sensitive taxa of macroinvertebrates and periphyton. Basically, zinc concentrations in sediment are highest where the numbers of metals sensitive taxa are low and where the metals tolerant taxa are high. Fish community structure follows a similar path.

- Defining impairment from the Palmerton Zinc Pile Site in the Upper Lehigh River for macroinvertebrates and periphyton is difficult, but it appears the sites above the confluence with Aquashicola Creek were not impaired, while those sites below the confluence were somewhat impaired. This assessment is not as clear as the assessment for the tributary streams. A comprehensive study would require a more

defined sampling approach for macroinvertebrates, algae, fish, and sediment/tissue metals concentrations along a longitudinal downstream gradient to establish the downstream extent of site impacts perhaps to the confluence with the Delaware River as well as a more limited latitudinal design to investigate the bank-to-bank evidence of Site impacts.

INTRODUCTION

The Palmerton Natural Resource Trustee Council (Trustees), comprised of the U.S. Department of the Interior Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), Pennsylvania Fish and Boat Commission (PFBC), Pennsylvania Department of Environmental Protection (PA DEP), Pennsylvania Department of Conservation and Natural Resources (DCNR), and the Pennsylvania Game Commission (PGC), is concerned with possible risks to the aquatic environment and potential injury to natural resources and the services these resources provide due to contaminants released from the Palmerton Zinc Pile Superfund Site. Following the completion of an Ecological Risk Assessment Work Plan for Operable Unit 4 conducted by Blasland, Bouck, and Lee, Inc. (BBL Science Arcadis) the Trustees decided to evaluate the aquatic biological community in detail. An assessment was adopted by the Trustees (Palmerton Natural Resource Trustee Council 2006) with a focus on:

1) Determining if aquatic periphyton and benthic macroinvertebrate community composition is impaired in the area affected by site related contaminant releases; and
2) Determining if aquatic community function is impaired in the area affected by site related contaminant releases.

The Palmerton Zinc Pile Superfund Site (the "Site") is located in the Ridge and Valley Province of Carbon, Lehigh, and Northampton Counties, Pennsylvania. Facilities at the Site include the East and West Plants of the former New Jersey Zinc Company, a primary zinc smelting facility. This facility discharged metals to the surrounding environment via air emissions and through the release of solid wastes, including the creation of a large waste pile (the "cinder bank"). Hazardous substances released to the environment from these facilities include arsenic, cadmium, chromium, copper, lead, manganese, and zinc.

The Palmerton valley is bordered by Blue Mountain to the south, Stony Ridge to the north, and is cut through by the Lehigh River to the west of the Borough of Palmerton. Aquashicola Creek drains the majority of the Site, flowing in a southwest direction through the town of Palmerton and joining the Lehigh River at the Lehigh Gap. Over ninety years of smelting operations emitted large quantities of metals that were wind carried and deposited over surrounding areas. The release of these metals resulted in defoliation of thousands of acres throughout this section of eastern Pennsylvania (USEPA 1987).

The main areas of study for this bioassessment (Figure 1) included:

- Aquashicola Creek, from one mile upstream of the confluence of Aquashicola and Buckwha Creek downstream to the confluence with the Lehigh River (including a site on Mill Creek)
- Buckwha Creek above the confluence of Hunter Creek and above the confluence with Aquashicola Creek
- The Lehigh River from Parryville, PA to the vicinity of Coplay, PA

The Palmerton Zinc Pile Site was divided into Four Operable Units (OUs) by USEPA: OU-1- Blue Mountain; OU-2- a 2.5 mile long, 32 million ton residual waste cinder bank; OU-3- the residences and yards of the residents of the Borough of Palmerton, Village of Aquashicola and Lower Towamensing Township; and OU-4- surface water, groundwater, and ecological risk for the entire site.

METHODS

Study Sites

A study of the periphyton and benthic macroinvertebrate communities was initiated in October 2006 at one site on Mill Creek, two sites on Buckwha Creek, and seven sites on Aquashicola Creek (Table 1) with site selection closely following that of the historical sites from USEPA (2001) and Wills (2002) and reference site determination from Palmerton Natural Resource Trustee Council (2006a).

Table 1. Site Locations and Descriptions Mill, Buckwha, and Aquashicola Creeks- October 2006 and August 2007

Site	Number	Latitude/Longitude	Description
Mill Creek	MC01	4048.887N/07535.683W	Off Stony Ridge Rd., Aquashicola, PA
Buckwha Creek	**BC10**	4049.918N/07531.250W	Above Confluence wtih Hunter Creek
Buckwha Creek	**BC09**	4049.359N/07531.558W	Above Confluence with Aquashicola Creek
Aquashicola Creek	**AC08**	4049.497N/07530.603W	Above Confluence with Buckwha Creek
Aquashicola Creek	**AC07**	4049.214N/07531.429W	Near Confluence with Buckwha Creek
Aquashicola Creek	AC06*	4049.014N/07532.162W	Upstream from Cinder Bank
Aquashicola Creek	AC05*	4048.934N/07533.142W	Behind Ampel Building
Aquashicola Creek	AC04*	4048.719N/07534.112W	Behind Sub-station
Aquashicola Creek	AC03/02*	4048.212N/07536.029W	6th & Lehigh Sts., Palmerton, PA
Aquashicola Creek	AC01*	4047.642N/07536.699W	Between Mouth and WWTP

* Sites sampled in both 2006 (high flows) and 2007 (low flows)
Bolded sites were reference sites

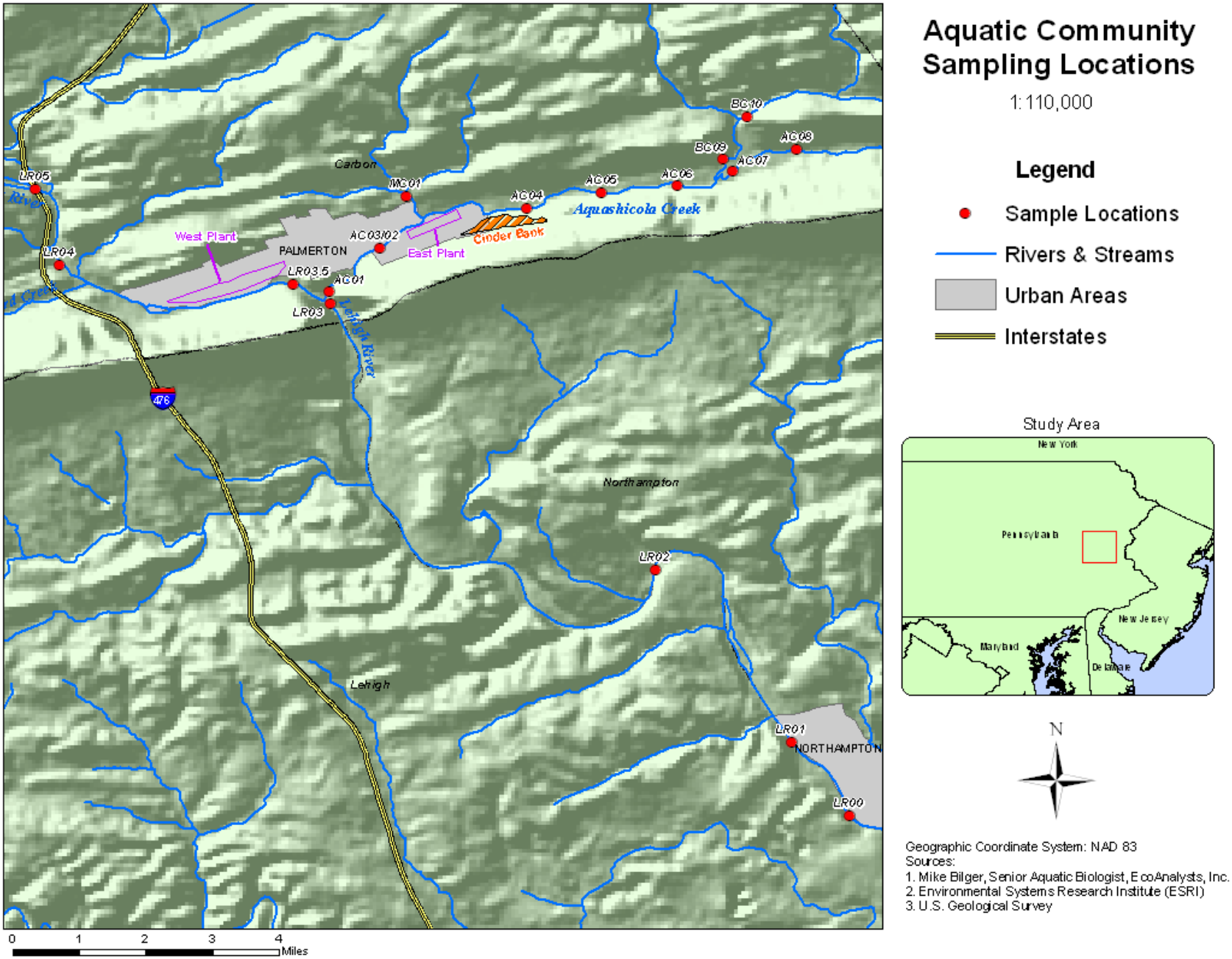

Figure 1. Palmerton Study Sites 2006-2007

In July/August 2007 seven sites on the Lehigh River main stem (Table 2) were sampled. The site locations were chosen by the Trustees to include areas upstream of the confluence of Aquashicola Creek and thought to be out of the influence of the Zinc Pile Site as well as sites downstream of the confluence considered to be within the influence of the Site.

Table 2. Site Locations and Descriptions for Lehigh River- July and August 2007

Site	Site Number	Latitude/Longitude	Description
Lehigh River	**LR05**	4048.976N/07540.521W	Near Parryville, PA
Lehigh River	**LR04**	4047.990N/07540.216W	At Bowmanstown Bridge
Lehigh River	LR03.5	4047.738N/07537.159W	Above Confluence Aquashicola Creek
Lehigh River	LR03	4047.483N/07536.684W	Below Confluence Aquashicola Creek
Lehigh River	LR02	4044.009N/07532.438W	At Treichler's Bridge
Lehigh River	LR01	4041.764N/07530.657W	At Tri-boro Sportsman's Club
Lehigh River	LR00	4040.805N/07529.916W	At Coplay, PA

Bolded sites are reference sites

A full description of the methods for evaluation of physical habitat and water chemistry, benthic macroinvertebrate and periphyton collection, laboratory procedures, sorting quality assurance, sample identification, quality control of taxonomic identifications, and bioassessment have been given previously in (EcoAnalysts 2006) and (Barbour *et al.* 1999).

RESULTS AND DISCUSSION

Historical Data Review

Studies concerning the ecological impacts in the vicinity of the Palmerton Zinc Pile Site have been conducted over the past 20 years, but those with aquatic biota as the focus, more specifically - benthic macroinvertebrates, periphyton, and fish - are limited. Literature on biotic resources and contaminants that have provided useful information for this report are Kime and Moyer (1986), PA DEP (1988), Carline and Jobsis (1993), Kupsky (1996), USEPA (2001), Wills (2002), Young (2002), BBL (2005), Rigg (2007), EcoAnalysts, Inc. (2007), PA DCNR (2003), and Palmerton Natural Resources Trustees Council (2004, 2005, 2006a, and 2006b).

Study Site Observations

Brief narratives of each site from the 2006 kick and jab samples were included to better describe the unique characteristics. Other specific characteristics of each site are given in Tables 3-6. For AC06, AC05, AC04, AC03/02, and AC01 the site descriptions are representative of the 2006 and 2007 sampling efforts. Photographic documentation of each site has been previously provided to the Trustees.

Mill, Buckwha, and Aquashicola Creeks 2006-2007

MC01- This site was located on Mill Creek within a residential setting about 500 meters upstream of the confluence with Aquashicola Creek and with the reach beginning about 20 meters downstream of Stony Ridge Road in Aquashicola, PA. The stream was about 6 meters wide and 0.3 meters deep with a high gradient riffle-run-pool sequence. A high gradient stream is defined as possessing a steep slope and rapid flow within a steep V-shaped valley. A riffle is characterized as an area of fast current velocity with shallow depth and a flow that breaks the water surface. A run is characterized as an area with rapid but non-turbulent flow that does not break the water surface. The substrate was dominated by cobble and boulders and there was little woody debris. This site supported a diverse benthic macroinvertebrate community based on the number of total taxa and Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa and salamanders that were present. The alga *Cladophora* covered about 30% of the reach area.

BC10- This site was located on Buckwha Creek within a forested-residential setting in Little Gap, PA 50 meters above the confluence with Hunter Creek. This site was considered a reference site and it was the most upstream from the Site. The stream was about 10 meters wide and 0.3 meters deep with a riffle-run sequence. The substrate was dominated by cobbles and there was limited woody debris. A diverse benthic macroinvertebrate community with good numbers of total and EPT taxa were present. About 50% of the substrate was covered with diatom growth.

BC09- This site was considered a reference and was located on Buckwha Creek about 550 meters above the confluence with Aquashicola Creek and about 1000 meters downstream of BC10 in an area of overgrown fields. The stream was about 23 meters wide and 0.3 meters deep with a riffle-pool sequence. However, the upstream boundary of the reach also included a portion of a large deep pool. The substrate was mostly cobble-gravel and there was little woody debris. The benthic macroinvertebrate community was well represented by total and EPT taxa. About 60% of the reach area was covered by diatom growth.

AC08- This reference site was the most upstream site sampled on Aquashicola Creek. The site is located at the base of the ski resort within a wetland area and 1200 meters above the confluence with Buckwha Creek. The reach was about 6 meters wide and 0.7 meters deep and characterized as a lower gradient compared to the other sites. A true low gradient stream is level and sluggish in flow with low sediment transport and a meandering nature. The substrate was mostly gravel-sand with larger materials confined to a short 10 meter riffle. Although the riffle area was short in length the benthic macroinvertebrate community was well represented by total and EPT taxa. About 60% of the reach was covered by the macrophyte *Elodea* sp. The area was rich in the numbers of fishes observed.

AC07- This reference site on the Aquashicola Creek was located about 500 meters above the confluence with Buckwha Creek in a wetland area. A water intake structure was located within the reach area. The stream was about 7 meters wide and 0.8 meters deep and dominated by a slow run with several short riffles. The substrate was predominantly cobble with 10% muck-mud in the slower run areas. The benthic macroinvertebrate community was well represented by total and EPT taxa. About 80% of the reach was covered by the alga *Cladophora* likely due to the lack of shading. Numerous fishes were observed within the reach area.

AC06- This site was located in an area of overgrown fields about 600 meters below the confluence with Buckwha Creek off Harris Lane and upstream of the cinder bank. The stream was about 20 meters wide and 0.7 meters deep in a riffle-run area. The substrate was predominantly cobble with little woody debris present. The benthic macroinvertebrate community was diverse at this site as evidenced by the total and EPT taxa present. About 70% of the reach was covered in attached algae.

AC05- This site was located about 500 meters above the cinder bank, about 1500 meters downstream of AC06, and behind the former Ampel Building in an overgrown field- commercial area. The stream was about 20 meters wide and 0.3 meters deep in a riffle-run area. The substrate was mainly cobble with little woody debris present. Although the benthic community appeared to be diverse, the taxa richness and EPT taxa values were lower than any of the upstream sites. About 80% of the reach was covered by the alga *Cladophora*.

AC04- This site was located about 1200 meters downstream of AC05 behind the electric sub-station in a commercial land use area and adjacent to the cinder bank. The stream was about 20 meters wide and 0.5 meters deep in a riffle-run area. The substrate was predominantly cobble with little woody debris present. The benthic macroinvertebrate community assemblage was very similar to that at AC05. About 80% of the reach was covered in the alga *Cladophora.* During the 2007 kick sample collections, it appeared that this site had been recently impacted by a/several stressor(s) since the organisms were noticeably more difficult to find and the total and EPT taxa values were down from 2006. There were also sheets of dead algae coating the bottom. (No explanation for the dead algal sheets or reduced macroinvertebrate richness is offered at this time).

AC03/02- This site was located nearly 3000 meters below AC04 and downstream of the East Plant within the Borough of Palmerton in a residential-industrial area. The stream was about 16 meters wide and 0.3 meters deep in a riffle-run area with rip-rap on both sides. The substrate was mostly cobble with little woody debris present. The benthic macroinvertebrate community showed a decline in total and in EPT taxa, and in particular, a scarcity of mayflies. The entire reach was covered in the alga *Cladophora.*

AC01- This site was located about 800 meters downstream of AC03/02 and between the confluence with the Lehigh River and the Wastewater Treatment Plant (WWTP) in Palmerton in

a forested-commercial area. The stream was about 22 meters wide and 1 meter deep in a riffle-run area. The substrate was mostly cobble with the presence of some woody debris. The benthic community was similar to AC03/02 in that taxa richness was lower than the sites upstream of the cinder bank and that mayflies were absent. Attached algae (diatoms) completely covered this reach.

In August 2007, sites AC06, AC05, AC04, AC03/02, and AC01 were re-sampled for benthic macroinvertebrates (kick samples only) and periphyton (rock scrapes and periphytometers) because conditions in October of 2006 included higher than normal flows that inhibited access to some streams and a significant loss of periphytometers. The sites upstream of AC06 were not sampled in 2007 because the work done in 2006 define that the algal scrapes and macroinvertebrate assemblages were representative of unimpacted reference sites. Overall taxa richness values for the benthic macroinvertebrates were similar between collections except at AC06 and AC05, where the 2007 values were significantly greater. This increase in taxa richness, particularly differences in mayfly and caddisfly richness is likely due to the difference in flows between years which influenced the ability to obtain a representative sample. The presence of seasonal population differences between 2006 and 2007 might also explain the differences. Sites below the cinder bank were more similar between years for the kick samples.

Lehigh River 2007

LR05- This reference site was located immediately downstream of the Pennsylvania Turnpike Bridge in Parryville, PA within a mixed forested-commercial area. The river was about 84 meters wide and 0.5 meters deep in a riffle-run area. The substrate was mostly composed of cobble with little woody debris present. The benthic macroinvertebrate community was represented by a diverse fauna rich in total and EPT taxa. About 1% of the reach was covered with attached green algae.

LR04- This reference site was located immediately upstream of the Route 895 bridge in Bowmanstown, PA about 3000 meters below LR05 and within a residential-commercial area. The stream reach was about 68 meters wide and 0.3 meters deep in an area of mostly riffle habitat. The substrate was mostly cobble with little woody debris present. The benthic macroinvertebrate community assemblage was very diverse. Approximately 5% of the reach was covered in attached algae and the macrophyte *Elodea* sp. was present.

LR03.5- This site was located about 900 meters upstream of the confluence with Aquashicola Creek and downstream of the West Plant within an industrial-commercial area. The river was about 81 meters wide and 0.3 meters deep in a riffle-run area. The substrate was mostly composed of cobble with little woody debris present. The benthic macroinvertebrate community had decidedly less taxa richness and EPT taxa than the upstream sites. Approximately 5% of the reach was covered in attached algae.

LR03- This site was located about 100 meters downstream of the confluence of the Aquashicola Creek in an area of commercial-industrial-forest. The river was about 102 meters wide and 0.3 meters deep in a mostly riffle area. The substrate was predominantly cobble with little woody debris. The benthic macroinvertebrate community was more diverse than LR03.5. Approximately 1% of the reach was covered in attached algae.

LR02- This site was located immediately below Treichler's Bridge off Route 145 and about eleven kilometers downstream of LR03 in a forested commercial-industrial area. The river was about 70 meters wide and 0.3 meters deep in a riffle-run area. The substrate was mostly cobble with little woody debris. Although still diverse, the benthic macroinvertebrate community was

less diverse than the upstream sites. Approximately 50% of the reach was covered in attached algae.

LR01- This site was located at the Tri-boro Sportsman's Club upstream of the Cementon Dam and about 16 kilometers downstream of the confluence with the Aquashicola Creek in a forested residential-industrial area. The river was about 64 meters wide and 0.3 meters deep in an area of mostly riffles. The dominant substrate was bedrock with little woody debris. The benthic macroinvertebrate community appeared very diverse. Approximately 70% of the reach was covered by attached algae.

LR00- This site was located in the Northampton Borough Park in Coplay, PA within a forested residential area and about 2000 meters downstream of LR01. The river was about 56 meters wide and 0.3 meters deep in a mostly riffle area. The substrate was predominantly cobble with about 5% bedrock and little woody debris. The benthic macroinvertebrate community appeared similar to that of LR01. Approximately 60% of the reach was covered in attached algae.

Physical Habitat

Mill, Buckwha, and Aquashicola Creeks 2006-2007

At each of the 17 sites sampled in 2006-2007 for both benthic macroinvertebrates and periphyton, a suite of water quality parameters was also collected (Table 3). A detailed USEPA high gradient habitat scoring sheet was completed (Table 4) and a macroscopic bottom substrate characterization was conducted (Table 5).

Table 3. Water Quality Measurements-Mill, Buckwha, and Aquashicola Creeks and Lehigh River 2006-07

Site	**Temperature (°C.)**		**Specific Conductance (uS/cm)**		**pH (Standard Units)**		**Dissolved Oxygen (mg/l)**		**Total Dissolved Solids (g/L)**	
Year	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
MC01	11.89	-----	*	-----	6.28	-----	6.26	-----	*	-----
BC10	11.78	-----	*	-----	6.05	-----	7.61	-----	*	-----
BC09	13.79	-----	*	-----	6.32	-----	7.32	-----	*	-----
AC08	13.93	-----	*	-----	7.81	-----	6.10	-----	*	-----
AC07	13.08	-----	*	-----	6.94	-----	6.00	-----	*	-----
AC06	12.61	24.02	*	155	6.32	8.14	5.38	10.70	*	1.03
AC05	14.56	20.33	*	133	7.14	7.48	6.78	7.91	*	0.094
AC04	15.19	27.7	*	162	6.95	7.86	6.12	8.34	*	0.115
AC03/02	13.70	23.79	*	232	6.19	7.96	-----	10.12	*	0.155
AC01	13.94	25.38	*	254	7.02	8.59	-----	12.19	*	0.164
LR05	-----	22.03	-----	88	-----	6.26	-----	7.72	-----	0.060
LR04	-----	23.99	-----	94	-----	6.39	-----	8.46	-----	0.063
LR03.5	-----	24.53	-----	109	-----	7.34	-----	8.94	-----	0.072
LR03	-----	27.00	-----	117	-----	7.54	-----	8.70	-----	0.058
LR02	-----	26.32	-----	132	-----	7.67	-----	8.79	-----	0.082
LR01	-----	27.12	-----	139	-----	8.86	-----	9.87	-----	0.087
LR00	-----	24.20	-----	140	-----	7.18	-----	8.00	-----	0.093

* Meter malfunction was discovered after collection and verified by Yellow Springs Instruments (YSI) therefore the values could not be quality assured

----- Parameter was not measured

The habitat scores by category and total (200 is maximum) are given in Table 4. A detailed explanation of each parameter is given in Barbour *et al.* 1999. The scores were ranked as

follows: optimal: 200-160; suboptimal: 159-110; marginal: 109-60; and poor: <59. The “best” scores in 2006 from the tributary streams were from AC04, MC01, and BC09 and ranged from 165 to 156. The lowest score of 125 was from AC08 in 2006 which reflected the low gradient condition. The remainder of the sites scored in the suboptimal range and were 80% or greater than reference. Keep in mind that impacted sites that score higher than reference sites is not an uncommon situation since water quality issues like metals do not affect all of the 10 parameters that make up the scoring. In 2007, the scores fluctuated from the 2006 scores most notably for AC03/02 which scored 108 in the marginal range. The remainder of the sites was considered to be in the suboptimal category. Most of the differences in scoring between collections were related to metrics influenced by flow conditions such as velocity/depth, channel flow, and frequency of riffles.

Table 4. Habitat Scores for Mill, Buckwha, and Aquashicola Creeks 2006-2007*

Parameters	**MC01**	**BC10**	**BC09**	**AC08**	**AC07**	**AC06**		**AC05**		**AC04**		**AC03/02**		**AC01**	
Epifaunal substrate/cover	17	16	17	12	15	17	17	17	16	18	17	16	11	18	18
Embeddedness	16	14	17	10	15	14	15	16	15	14	15	16	10	15	15
Velocity/Depth	17	17	16	8	9	11	13	10	13	15	15	15	10	18	14
Sediment Deposition	18	13	11	6	10	15	13	14	13	14	13	15	10	15	13
Channel Flow	18	18	18	18	18	18	18	18	18	18	19	18	17	18	16
Channel Alteration	18	18	18	17	18	18	19	14	19	17	19	7	15	14	19
Frequency of Riffles	18	8	18	6	15	6	15	18	18	19	18	17	17	7	10
Bank Stability															
Left	7	9	7	9	9	8	9	8	7	9	9	9	8	6	8
Right	9	7	7	9	9	9	9	8	8	9	9	9	10	8	8
Bank Vegetative Protection															
Left	3	10	5	9	9	8	7	7	9	9	4	2	4	6	8
Right	9	7	7	9	9	9	9	7	9	9	7	2	2	6	8
Riparian Vegetative Zone															
Left	3	10	7	8	4	5	4	2	5	7	4	2	2	6	5
Right	9	6	6	4	4	9	8	4	6	7	5	3	2	5	5
Total Score	**162**	**153**	**154**	**125**	**144**	**147**	**156**	**143**	**156**	**165**	**154**	**131**	**108**	**142**	**147**

* AC06, AC05, AC04, AC03/02, and AC01 the left column value was collected in 10/2006 and the right value in 8/2007.

Table 5 shows the general classifications of particle size (Barbour *et al.* 1999) determined by a qualitative macroscopic assessment using best professional judgment. Most sites had cobble as the dominant substrate except for AC08 which was lower gradient and had gravel-sand as the dominant particle sizes. There was a small percentage of silt-clay at the sites. At the five sites resampled in 2007, there was no substantial within site difference in the percent composition of the substrate from 2006 with cobble remaining the prevailing type.

Table 5. Macroscopic Bottom Substrate Characterization for Mill, Buckwha, and Aquashicola Creeks 2006 (Percent Composition in Reach)

Substrate Type	Bedrock	Boulder	Cobble	Gravel	Sand	Silt	Clay
Diameter		>256mm	64-256mm	2-64mm	0.06-2mm	0.004-0.06mm	<0.004mm
MC01	0	30	60	5	5	0	0
BC10	0	5	50	25	10	5	5
BC09	0	5	40	40	10	5	0
AC08	0	3	10	35	42	10	0
AC07	0	1	64	15	5	10	5
AC06	0	5	50	20	10	10	5
AC05	0	0	75	10	5	5	5
AC04	0	5	65	10	5	10	5
AC03/02	0	0	85	5	5	5	0
AC01	5	5	75	5	5	5	0

Lehigh River 2007

Table 6 shows the Lehigh River habitat scores which with the exception of LR01 were in the optimal range (>160). The natural condition at the LR01 site included a large stretch of bedrock which resulted in the lower scores for epifaunal cover, embeddedness, frequency of riffles, and channel flow.

Table 6. Habitat Scores for Lehigh River 2007

Parameters	LR05	LR04	LR03.5	LR03	LR02	LR01	LR00
Epifaunal substrate/cover	16	17	17	16	14	11	16
Embeddedness	17	15	17	16	17	11	16
Velocity/Depth	18	18	18	16	15	18	19
Sediment Deposition	18	18	18	17	16	14	17
Channel Flow	19	18	19	18	19	12	19
Channel Alteration	19	18	19	19	19	19	19
Frequency of Riffles	16	14	16	14	12	13	18
Bank Stability							
Left	9	9	9	9	9	10	9
Right	9	9	10	9	8	10	9
Bank Vegetative Protection							
Left	9	9	10	10	9	10	5
Right	9	9	9	9	9	10	10
Riparian Vegetative Zone							
Left	9	9	8	10	8	10	4
Right	10	9	8	10	8	10	10
Total Score	**178**	**172**	**178**	**173**	**163**	**158**	**161**

The dominant substrate type at the seven Lehigh River sites was cobble (Table 7). There was little silt-clay at these sites and the bedrock at LR01 was evident.

Table 7. Macroscopic Bottom Substrate Characterization for Lehigh River 2007 (Percent Composition in Reach)

Substrate Type	Bedrock	Boulder	Cobble	Gravel	Sand	Silt	Clay
Diameter		>256mm	64-256mm	2-64mm	0.06-2mm	0.004-0.06mm	<0.004mm
LR05	5	15	55	10	10	5	0
LR04	0	10	55	25	5	5	0
LR03.5	0	15	55	15	10	5	0
LR03	0	10	75	10	4	1	0
LR02	10	10	60	15	5	0	0
LR01	40	10	25	10	10	5	0
LR00	5	20	50	20	5	0	0

Macroinvertebrate Community

Mill, Buckwha, and Aquashicola Creeks 2006-2007

Kick and jab sampling methods are described in detail in Barbour *et al.* (1999). In this study two D-frame net samples were collected within a 100 meter reach in a riffle habitat by disturbing the bottom material upstream of the net. This material was composited and subsampled for 300 organisms. A jab sample was taken concurrently and comprised 20 samples taken with a D-frame net in proportion to all available habitats within a defined 100 meter reach. This material was also composited and subsampled for 300 organisms. Both sampling methods were selected since they show different aspects of the macroinvertebrate community. The kick samples are collected in the riffles or richest habitats with the “most” sensitive organisms usually dominating and the jab samples give a good representation of the entire range of macroinvertebrate taxa inhabiting a particular site. The lists of taxa and metrics by collection method are given in Appendix 3.

Summing all 10 sites collected in 2006 by kick and jab samples, a total of 155 taxa were identified, and an estimated 40,375 individual organisms were collected. The philopotamid caddisfly *Chimarra atterima* and the hydropsychid caddisfly *Cheumatopsyche* sp. were the dominant taxa in the upper sites, while *Hydropsyche morosa* and *Cheumatopsyche* sp. were dominant in the lower study sites in kick samples. In the jab samples, *Chimarra atterima* and the ephemerellid mayfly *Eurylophella* sp. were the dominant upstream taxa while the downstream sites were dominated by a mix of dipteran, water mite, odonates, and *Hydropsyche morosa*. A total of 98 taxa and 8,697 individual organisms were collected in 2007 at the five repeat Aquashicola Creek sites. The hydropsychid caddisfly *Hydropsyche morosa* was the dominant taxon.

Benthic macroinvertebrates can be exposed to hazardous metals in surface water, sediment, sediment pore water, and food items. Metals in surface water or sediment pore water can be

assimilated through direct uptake across gill surfaces and other external body parts (Dodge and Theis 1979, Weatherly 1980, Hare *et al.* 1991, Kapustka *et al.* 2003). Benthic macroinvertebrates can also be exposed to metals via the ingestion of a variety of contaminated food items since many species consume algae, periphyton, detritus, and other invertebrates (Merritt and Cummins 1984). This process is well documented in the literature in riverine systems below mining activities (Kiffney and Clements 1993, Lipton *et al.* 1995, Beltman *et al.* 1999). Benthic macroinvertebrates can also incidentally ingest contaminated sediment during feeding. This has been documented by Burrows and Whitton (1983), Smock (1983), Gower and Darlington (1990), and Hare *et al.* (1991).

Benthic macroinvertebrates have been used extensively to monitor the effects of metals contamination on aquatic systems. These organisms demonstrate individual level responses to metals (e.g., mortality, reduced growth, and reduced reproductive fitness) as well as community level responses (e.g., reduced density, reduced species richness, and community shift to more tolerant species). Some attributes that make benthic macroinvertebrates a useful tool for evaluating ecological effects of contaminants include:

- Intimate contact with sediments;
- Wide range of sensitivity to metals;
- Occupy limited home ranges;
- Integral part of the aquatic food chain;
- Integrate exposure conditions over life spans that can last several months to years;
- Relatively easy to monitor.

Community level responses are often used to evaluate the effects on benthic macroinvertebrates (Clements 1991). Where the concentrations of metals are sufficiently high, benthic macroinvertebrates may be entirely absent or their abundance greatly reduced (Clements 1991). Where metals concentrations do not entirely eliminate the community, however, measures of taxa richness (total number of species present) or abundance of metals sensitive taxa provide the most sensitive and reliable measure of community levels effects (Barbour *et al.* 1992, Clements and Kiffney 1995, Carlisle and Clements 1999). Invertebrate taxa richness is reduced by exposure to metals as sensitive species are eliminated. Communities exposed to metals exhibit reduced taxa richness are thus dominated by metal-tolerant species, which effectively alters community structure. It appears that measures of taxa richness and a shift in the community composition from the mostly sensitive taxa (mayflies with the exception of the metals-tolerant baetids) to mostly tolerant taxa (Orthocladiinae chironomids and caddisflies) are found to be the most reliable and consistent metrics (Sprague *et al.* 1965, Hubbard and Peters 1978, Winner *et al.* 1980, Chadwick *et al.* 1986, Clements *et al.* 1988, Lynch *et al.* 1988, Roline 1988, Leland *et al.* 1989, Clements *et al.* 1989, Clements 1991, Clements *et al.* 1992, cited in Clements 1994).

In contrast to community based metrics like taxa richness or the presence of metals-tolerant taxa, other metrics such as total macroinvertebrate density (or total abundance) or functional feeding group metrics provide a much less sensitive and less reliable measure of metal effects (except where extremely high concentrations of metals are encountered). Critics of the density metric cite the replacement theory where metals-sensitive taxa were replaced by metals-tolerant ones and there was a resultant lack of correlation between the metal(s) concentration and total abundance (Clements 1994).

Research into the physiological effects of heavy metals on macroinvertebrates is on going. Cain *et al.* (2004) studied the Clark Fork River in Montana and commented on the fact that metals sensitivities in macroinvertebrates are based on non-specific tolerance indices, when, in fact metal specific sensitivities are rarely known. In this study, comparative analysis of sub-cellular

metal partitioning into metals-sensitive (*Epeorus*) and detoxified compartments (hydropsychids) was used as a basis to interpret vulnerabilities of different taxa to metals exposure. Buchwalter (2005) studied differences in dissolved zinc and cadmium uptake in a select set of individual taxa of mayflies, stoneflies, and caddisflies. Metal uptake proved to be similar among species of the same genus but not within orders and variability within orders was as great as among orders. Buchwalter (2007) also showed that toxicity tests conducted in the laboratory are difficult to interpret since these organisms have complex life histories; often unknown dietary requirements; and various flow, substrate, and temperature requirements.

A set of 10 metrics were chosen from the literature that are frequently used in benthic macroinvertebrate community bioassessments dealing with possible metals contaminants (Rogers *et al.* 2002). These are not the only metrics that could be examined to define the health of the community but they were chosen to cover a range of community richness and dominance measures, community composition, functional feeding group composition, and diversity and biotic indices.

Bar graphs show metric values of each individual upstream and downstream site collected by kick samples in 2006, those selected as a repeat site in 2007, and the 2006 jab samples. Because stream conditions like temperature and flow can vary greatly among the seasons and years, which actually happened during this study, comparisons of benthic macroinvertebrate community should be made carefully because many taxa have seasonal life stage differences totally independent of point source and other stressor impacts.

Species richness (number of discrete species) represents the diversity within the sample (Figure 2). Increasing diversity correlates with increasing health of the assemblage and suggests that niche space, habitat, and food sources are adequate to support the survival and propagation of many species. Species richness values of >30 are considered representative of good water quality. The values in the kick samples in 2006 ranged from 64 at MC01 to 31 at AC03/02 while the jab samples ranged from 84 at AC07 to 45 at AC03/02 (Figure 2). In 2007, the five sites collected on Aquashicola Creek ranged from 60 at AC06 to 29 at AC04.

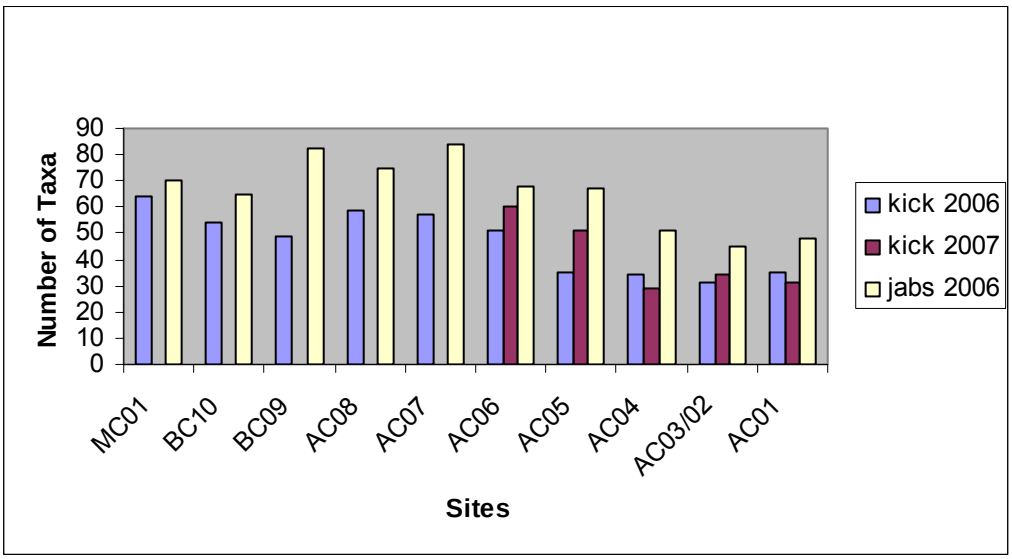

Figure 2. Species Richness Palmerton Zinc Pile Site 2006-07

EPT richness denotes the total number of species of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) found in a sub sample (Figure 3). These are considered organisms mostly representative of clean water and their presence is generally correlated with good water quality. Representative EPT fauna collected within Mill, Buckwha, and Aquashicola Creeks were the mayflies from the families Baetidae, Heptageniidae, and Ephemerellidae; the stoneflies from the families Perlidae, Taeniopterygidae, and Perlodidae; and caddisflies from the families Hydropsychidae, Philopotamidae, Rhyacophilidae, Polycentropodidae, and Brachycentridae. These organisms mostly prefer a riffle habitat with a cobble dominated bottom substrate (Brigham *et al.* 1982). While most sites upstream of AC05 for all sampling events exhibited values of ≥ 20, which is considered representative of good water quality, there was a noticeable decline in EPT richness values below the cinder bank area continuing to the mouth of Aquashicola Creek.

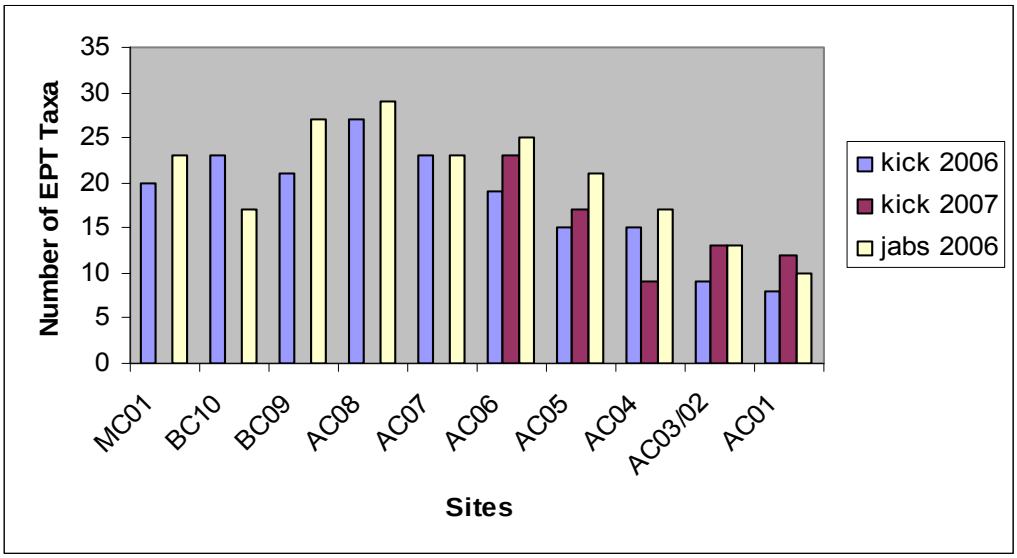

Figure 3. EPT Richness Palmerton Zinc Pile Site 2006-07

Ephemeroptera (mayfly) richness is a key metric when assessing the presence of bioavailable metals at a site since most mayflies are generally sensitive to metals while many caddisflies and stoneflies are relatively tolerant (Warnick and Bell 1969 and Clements *et al.* 1992). The mayfly richness values began a rather abrupt decline downstream of AC05 in the kick samples and were non-existent by AC01 for both sample methods (Figure 4).

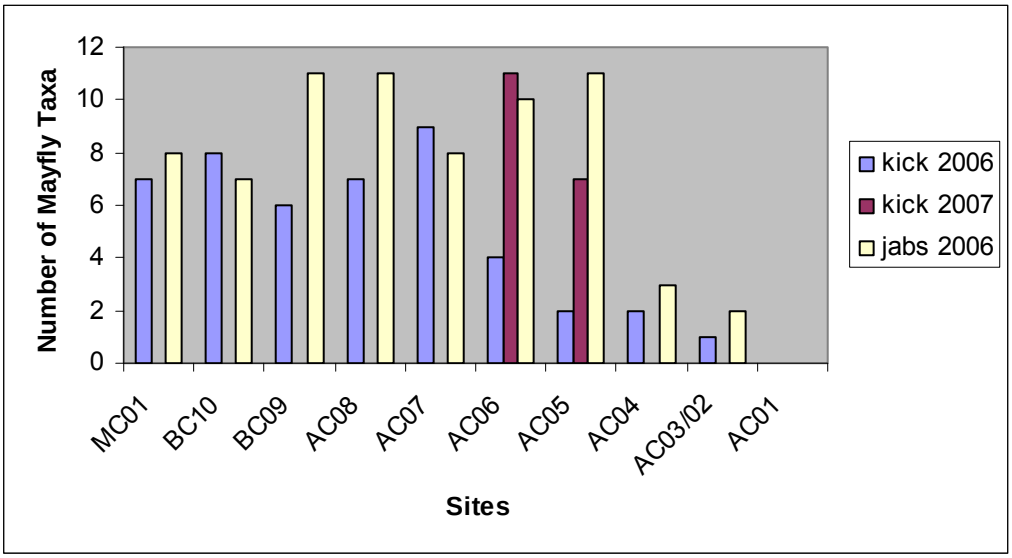

Figure 4. Ephemeroptera (Mayflies) Richness Palmerton Zinc Pile Site 2006-07

The percent contribution of the numerically dominant taxon to the total number of organisms is an indication of community balance at the lowest taxonomic level (mostly genus). A community dominated by relatively few species would indicate environmental stress. Often the top three or five taxa are combined in the percent contribution calculation and indeed Shackleford (1988) has modified the metric to reflect “dominants in common” (DIC) utilizing the dominant five taxa at stations of comparison. The DIC can provide a measure of replacement or substitution between the reference community and the downstream station. The single dominance values ranged from 11-40% in the 2006 kick samples, 12-58% in the 2007 kick samples, and 6-17% in the 2006 jab samples (Figure 5). AC01 had the highest values in both the 2006 and 2007 kick samples. Generally, field experience has proven non-impacted communities have <30% of the total taxa dominated by a single taxon. Overall, caddisfly genera belonging to the families Hydropsychidae and Philopotamidae were the dominant taxa below AC06. This was not necessarily surprising since these organisms have a known tolerance to both organic and metals contaminants (Clements and Kiffney 1995, Mize and Deacon 2002).

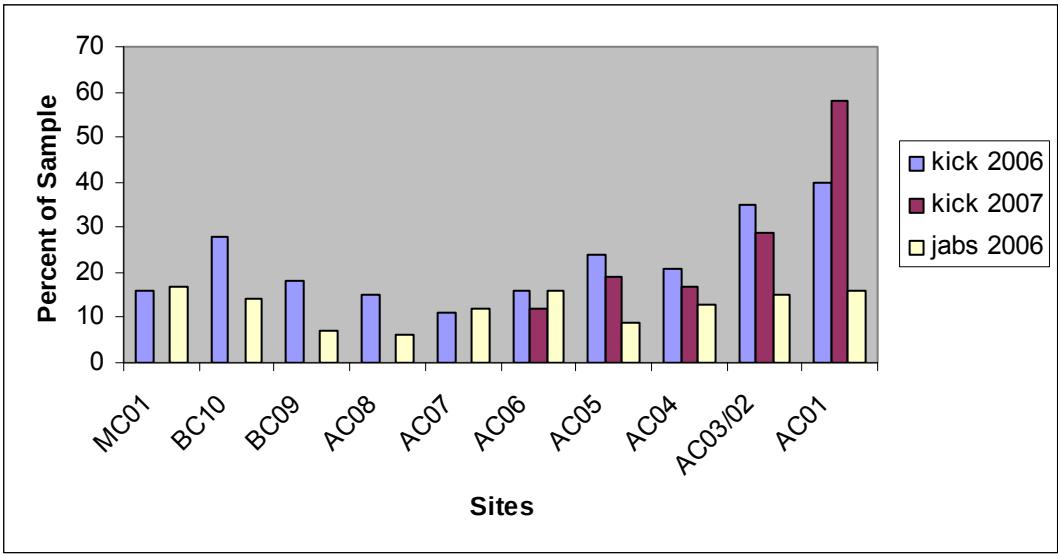

Figure 5. Percent Dominant Taxon (single) Palmerton Zinc Pile Site 2006-07

Along with the mayfly richness value is the percent of the community composed of mayflies. Upstream of AC05 the mayflies made up 7 – 17% of the community in kick samples, and 5-32% in the jab samples. Downstream at AC04 this percentage plummeted to 0.5% and to 0% at AC01 in the kick samples and 1.5-0% for the 2006 jabs (Figure 6). There were no mayflies collected below AC05 in the 2007 kicks; however, the 2007 kick samples at AC06 and AC05 had substantially greater numbers of heptageniid mayflies than the 2006 samples. While not conclusive, it appears the Ephemeroptera fauna are impacted by a metals related stressor(s) in the vicinity of the cinder bank and downstream from that point to the confluence of Aquashicola Creek and the Upper Lehigh River.

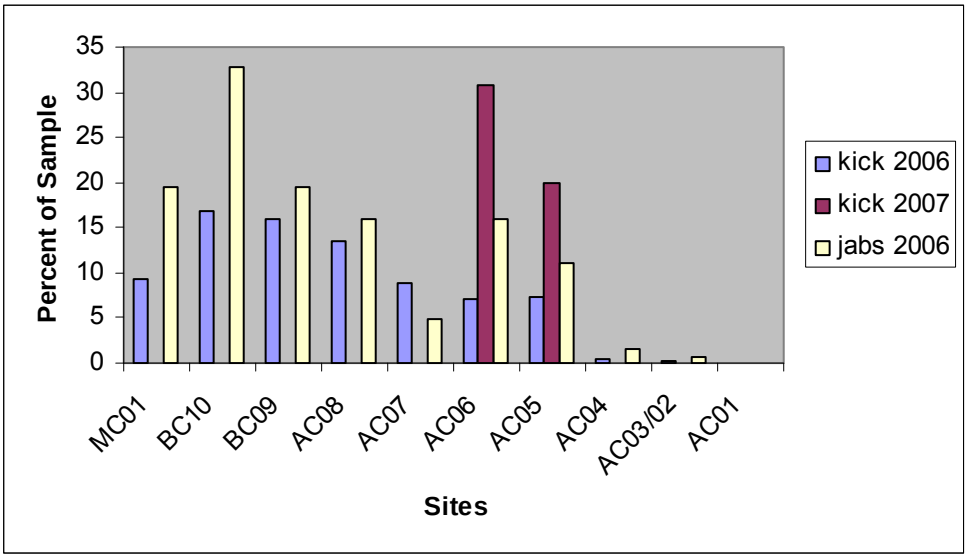

Figure 6. Percent Ephemeroptera (Mayflies) Palmerton Zinc Pile Site 2006-07

The percent hydropsychid caddisflies is the number of individuals belonging to the trichopteran family Hydropsychidae divided by the total number of individuals in a sample. Taxa in this family are net spinners that process particulate matter and have a known tolerance to heavy metals due to their physiological qualities that enable them to reduce risks to metals exposure (Cain *et al.* 2006). Therefore, a high percentage of these organisms represent conditions favorable for colonization at the exclusion of taxa that are more metals-sensitive. Values ranged from 7% at AC07 to 80% at AC03/02 for all kick samples to 2-29% in the jabs (Figure 7). The differences in values between the 2006 and 2007 kick samples may well be due to flow conditions or seasonal population shifts.

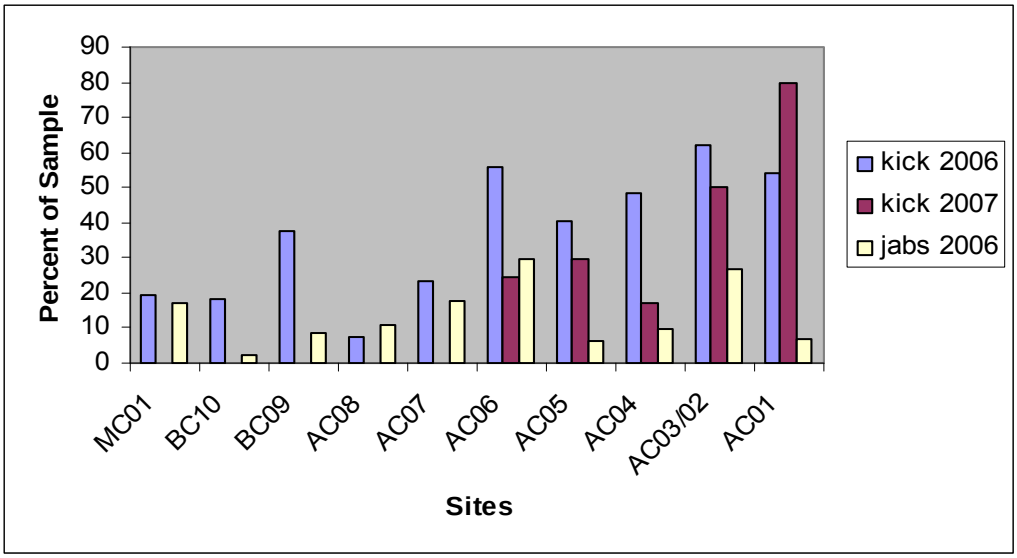

Figure 7. Percent Hydropsychid Caddisflies Palmerton Zinc Pile Site 2006-07

Percent tolerant taxa is the percentage of the total taxa in a sample that have a tolerance value of 8-10 on a scale of 0-10 with 0 being very intolerant and 10 very tolerant to various disturbance types. Values <15% indicate a balanced community structure. Although most values were less than 15% in the kick samples in 2006 and 2007, except for AC03/02, the jab samples were much more variable. This is because these samples did not focus on only one habitat (riffles), but on the animals occupying all the available habitats such as fine sediments which often harbor tolerant taxa (Figure 8).

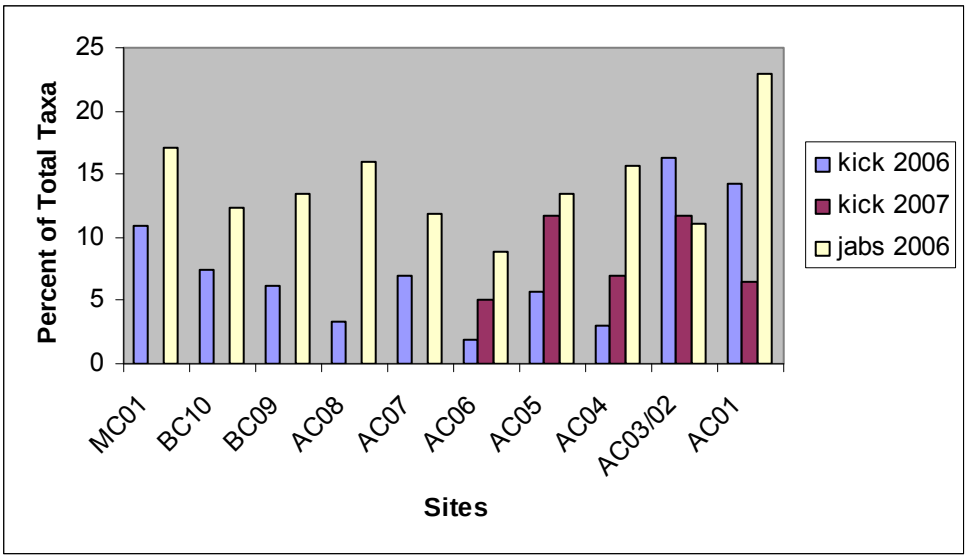

Figure 8. Percent Tolerant Taxa Palmerton Zinc Pile Site 2006-07

Percent collectors (filterers and gatherers) combines the total number of macroinvertebrate individuals that are percent collectors-filterers and percent collector-gatherers. The gatherers are a feeding group whose members collect fine particles of organic materials as their food source. They prefer areas that are depositional or have soft bottom substrates. The filterers use a variety of adaptations to capture fine organic particles suspended in the water column. In well-shaded mid-order streams the abundance of filterers is usually low. As shaded areas of habitat decrease and/or if there is an increase in organic particulate matter, numbers of this group usually increase. A balanced benthic macroinvertebrate community usually includes <30% of these organisms. Most of the sample locations for all methods/years exceeded 50% (Figure 9). These values are considered representative of poorer water quality in lower order streams. The hydropsychid caddisflies and blackflies *Simulium* sp. made up most of the collector gatherer-filterer percentage.

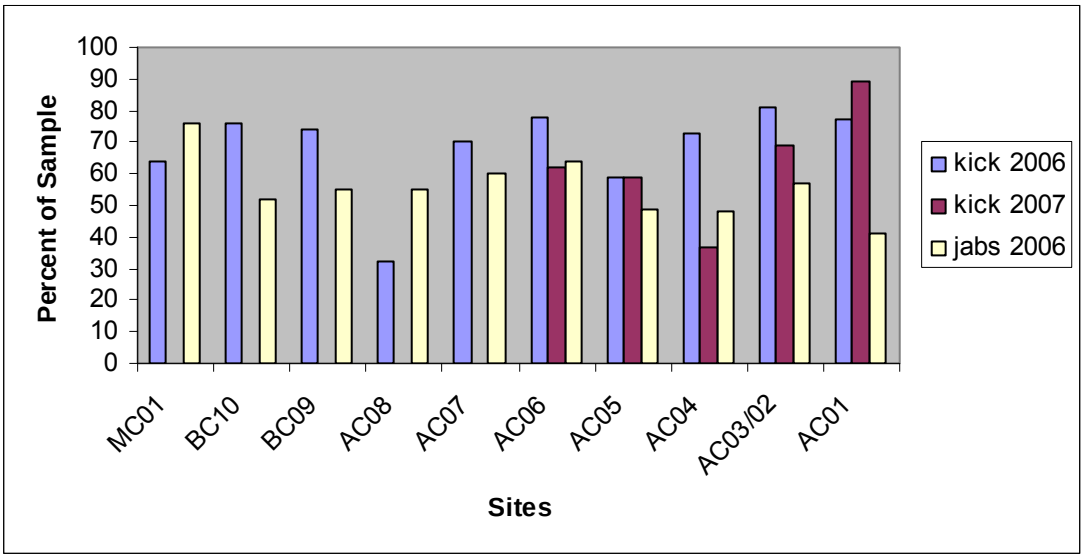

Figure 9. Percent Collectors (Filterers + Gatherers) Palmerton Zinc Pile Site 2006-07

Shannon-Weaver H' (log2) species diversity values combine species richness and community balance (evenness) and are calculated using a formula given by Weber (1973). High species diversity values usually indicate diverse, well-balanced communities, while low values indicate the presence of stressors or impact. A good water quality value is considered >3.0. Although values were above 3.0 for most kick sites there is still a noticeable downward trend in scoring below AC05 (Figure 10). The jab sample results, by their nature of covering taxa from all available habitats and not just riffles, are more complex and difficult to explain; however, those values also trended downward below AC05.

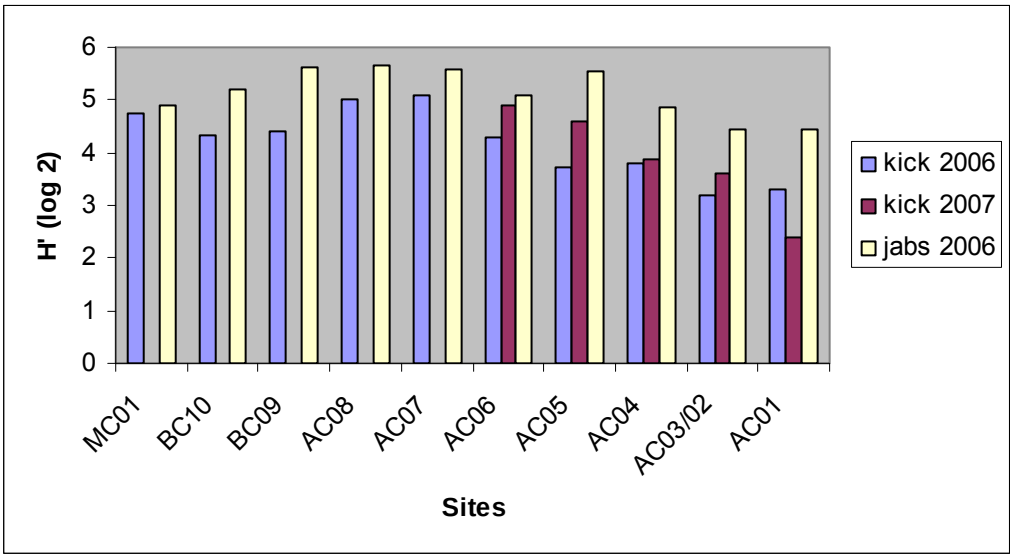

Figure 10. Shannon-Weaver Index H' (log 2) Palmerton Zinc Pile Site 2006-07

The Hilsenhoff Biotic Index (HBI) was calculated by multiplying the number of individuals of each taxon by its assigned tolerance value, summing these products and dividing by the total number of individuals. On a scale of 0-10, tolerance values range from intolerant (0) to tolerant (10) with a HBI score <4.0 being desirable. Tolerance values can vary by U.S. region and by regulatory agency. High HBI values are indicative of organic (sewage) pollution and possibly other stressors such as metals while low values are indicative of clean water conditions. The HBI values at all sites and methods/years studied were considered very good (3.51-4.50) to good (4.51-5.50) even at those sites below the cinder bank (Figure 11) indicating the lack of organic pollutants. In this study it appears the HBI is not that sensitive to metals impacts.

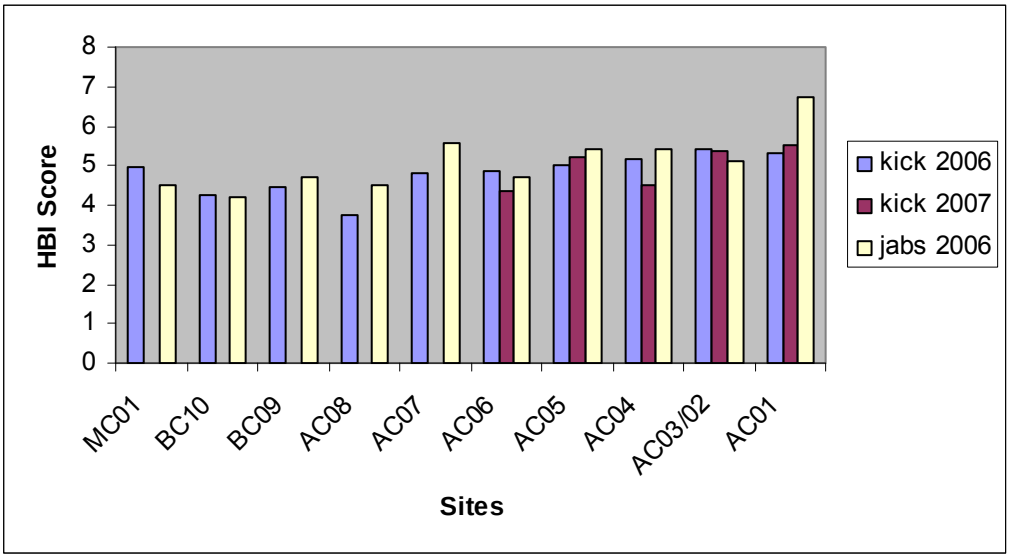

Figure 11. Hilsenhoff Biotic Index (HBI) Palmerton Zinc Pile Site 2006-07

PA DEP Antidegradation Integrated Benthic Macroinvertebrate Metrics

The Pennsylvania DEP developed a Rapid Bioassessment Protocol (RBP) as part of the state's antidegradation assessment activities under PA Code Title 25, Chapter 93.4(a) and (b) Water Quality Standards. The antidegradation process uses a reference stream, usually one with a special protection designation of exceptional value (EV) that is located in or near the same watershed being classified and which is sampled at the same time as the candidate stream.

Metrics have been developed by PA DEP from the existing Water Quality Network (WQN) data base (PA DEP 1997). These metrics were developed mainly by using the above referenced WQN data. The antidegradation program procedure found five metrics that were the most effective in discriminating subtle changes in macroinvertebrate community composition. These metrics were: taxa richness, a modified EPT Index (the number of pollution sensitive mayfly, stonefly, and caddisfly taxa where taxa with a Hilsenhoff pollution tolerance designation (HSCO) greater than or equal to five do not count), the modified Hilsenhoff Biotic Index (tolerance values assigned with a regional score), the percent dominant taxon in the total sample, and the percent modified mayfly individuals (with HBI <5) in the subsample.

A scoring scale (maximum of 30) was developed to normalize the different types of information each metric represented. This way each metric had an equal weight in the final result and could be added to obtain a total score. The total score of the sample site was compared to the total reference score to obtain a percentage. This percentage determined the status of the stream

(PA DEP 1999). The analysis of the PA DEP data showed that 83% was a number that differentiates between an average stream and those deserving antidegradation protection (Table 8).

Table 8. Classification Scores for Existing/Designated Use

% Comparison of Candidate Score to Reference Score	Stream Classification Category
≥ 92%	EV
83-91%	HQ
< 83%	No antidegradation

To attain an exceptional value classification (EV), the percent comparison of the candidate to the reference must be equal to or greater than 92%.

In order to attain a high quality classification (HQ), the percent comparison of the candidate score to reference score must be between 83 and 91%. This means that the summed biological condition score for the five metrics must total at least 26 (87%) when compared to the reference. Any summed biological condition score less than 26 would not qualify the candidate stream for antidegradation.

Using BC09 as the reference site to duplicate the PA DEP study from 2001 and making comparisons to the candidate streams without regard to their current classifications sites BC10, AC08, AC07, and AC06 were found to score 100% of reference (30 biological condition score) and considered EV in classification. Sites AC05, AC04, AC03/02, and AC01 did not qualify for antidegradation with respective scores of 24 (80%), 18 (60%), 12 (40%), and (10) 33%.

Lehigh River 2007

The macroinvertebrate collection methods followed Barbour *et al.* (1999) for the tributary sites; however, the Lehigh River samples were a composite of six D-frame kicks within riffles and a 500 organism count within a 100 meter reach. Jab samples were collected in the same manner as the tributary sites but the 20 jab samples were composited for a 500 organism count. Because the main stem river is a large body of water to sample the subsample was increased to better represent each site.

A total of 88 taxa and 25,378 individuals were collected at the seven kick sites in 2007 and 137 total taxa and 23,069 individuals in the jab samples (differences in methods were discussed previously). The most dominant taxa in the kick samples were the hydropsychid caddisfly (*Cheumatopsyche* sp.), elmid beetle (*Stenelmis* sp.), and baetid mayfly (*Baetis* sp.). In the jab samples the elmid beetle (*Stenelmis* sp.) and baetid mayfly (*Baetis* sp.) were dominant. These taxa are considered pollution tolerant to organics and metals.

A description of each of the metrics examined for the Lehigh River has been given in the preceding section. Large river systems like the Lehigh have complex ecosystem functions that are different from the tributary systems studied in this report (Vannote *et al.* 1980). Other notable factors that differentiate the Lehigh River and its tributaries are water quality, substrate diversity, and flow characteristics as well as the ability to adequately sample these more expansive habitats. Although a similar set of metrics is used to describe the benthic macroinvertebrate communities in the tributary streams and the river, direct comparisons are

inappropriate. Instead, trends within each ecosystem type should be examined. In fact, recent data sets describing benthic macroinvertebrate communities in large mid-Atlantic rivers are not common.

Species richness values ranged from 28 at LR02 to 59 at LR05 (reference site) for the kick samples, and 39 at LR00 to 77 at LR04 for the jab samples (Figure 12). Values overall trended lower downstream of LR03.

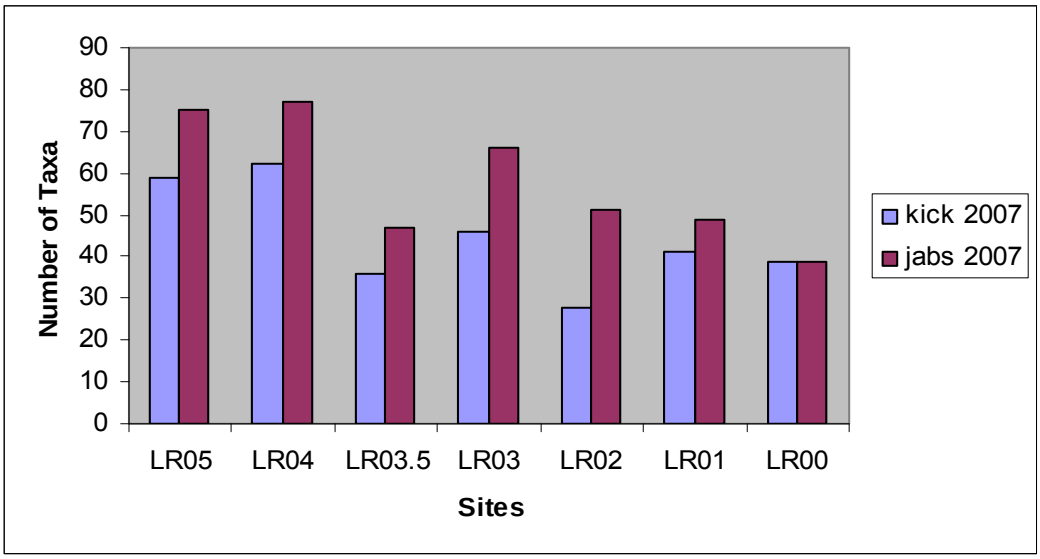

Figure 12. Species Richness Lehigh River 2007

The EPT richness values ranged from 17 at LR02 to 30 at LR04 for the kick samples, and from 19 at LR00 to 31 at LR04 and LR03 in the jab samples driven by the caddisfly richness (Figure 13). As in the species richness results the values trended lower at the more downstream sites.

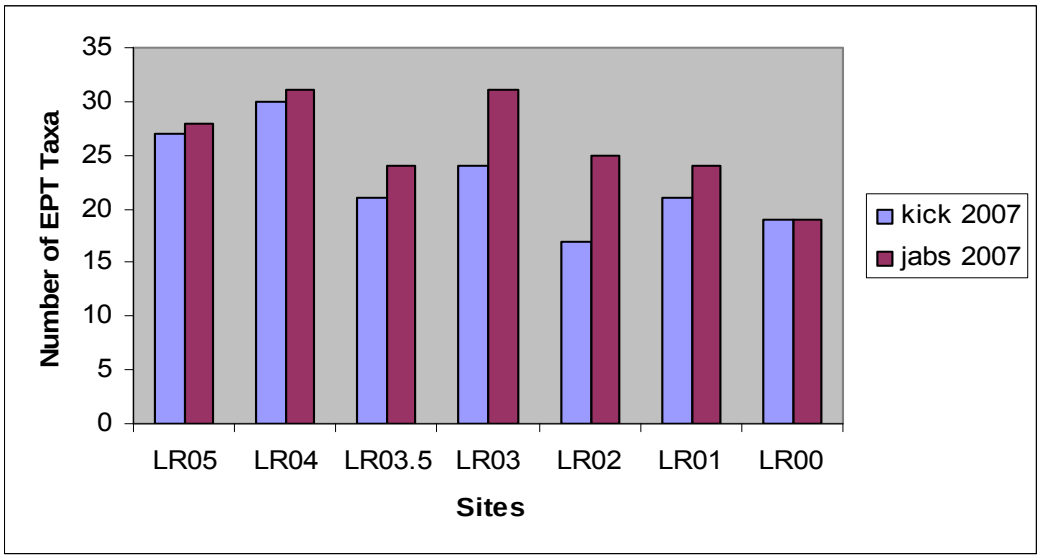

Figure 13. EPT Richness Lehigh River 2007

The Ephemeroptera (mayfly) richness values ranged from 5 at LR01 to 12 at LR05 for the kick samples, and 5 at LR00 to 14 at LR03 for the jab samples (Figure 14). As the other richness metrics have indicated this metric value was lowest downstream of LR03.

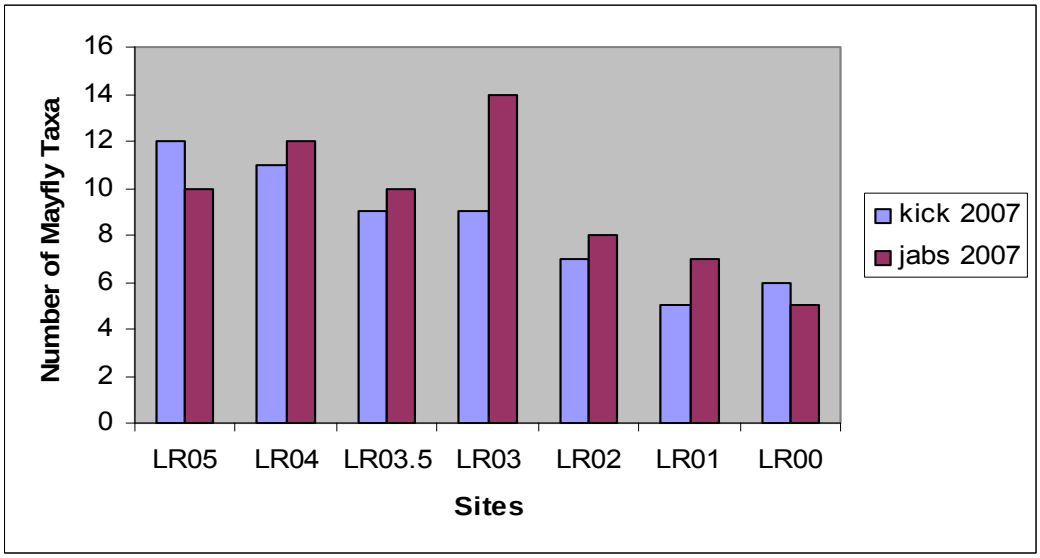

Figure 14. Ephemeroptera (Mayflies) Richness Lehigh River 2007

The percent dominant taxon values were all <30% and ranged from 15% at LR05 (*Baetis intercalaris*) and LR04 (*Stenelmis*) to 28% at LR03.5 (*Chimarra socia*) in the kick samples and 12% at LR05 *(B. intercalaris*) to 23% at LR00 (*Stenelmis*) in the jab samples (Figure 15). The lower percent dominance values were recorded above LR03.5.

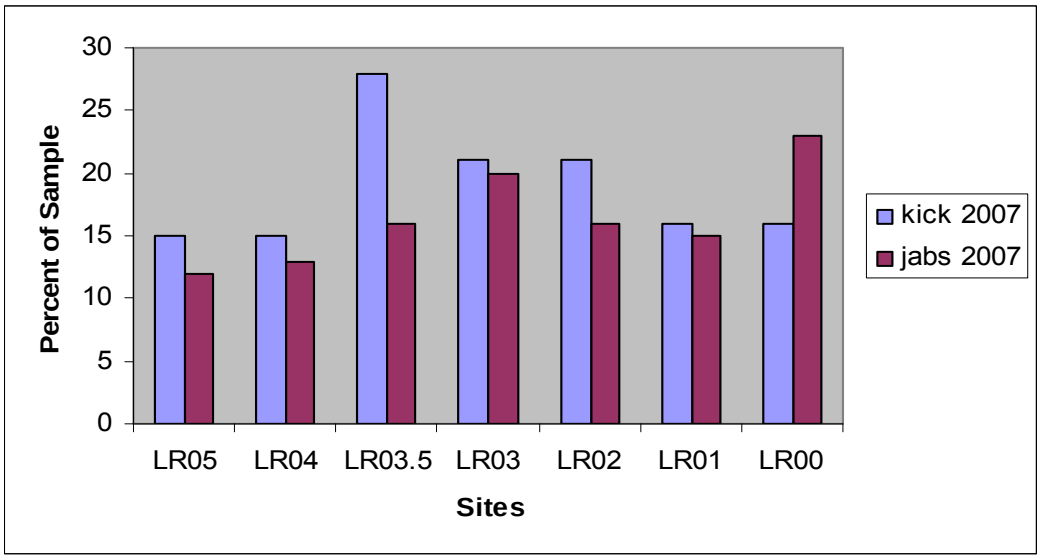

Figure 15. Percent Dominant Taxon (single) Lehigh River 2007

The percent Ephemeroptera (mayflies) values ranged from 13% at LR01 to 34% at LR05 for the kick samples and from 12% at LR00 to 31% at LR04 for the jab samples (Figure 16). Since most members of this insect order are sensitive to stressors, especially metals, a higher value is desirable. Values trended lower from upstream to downstream.

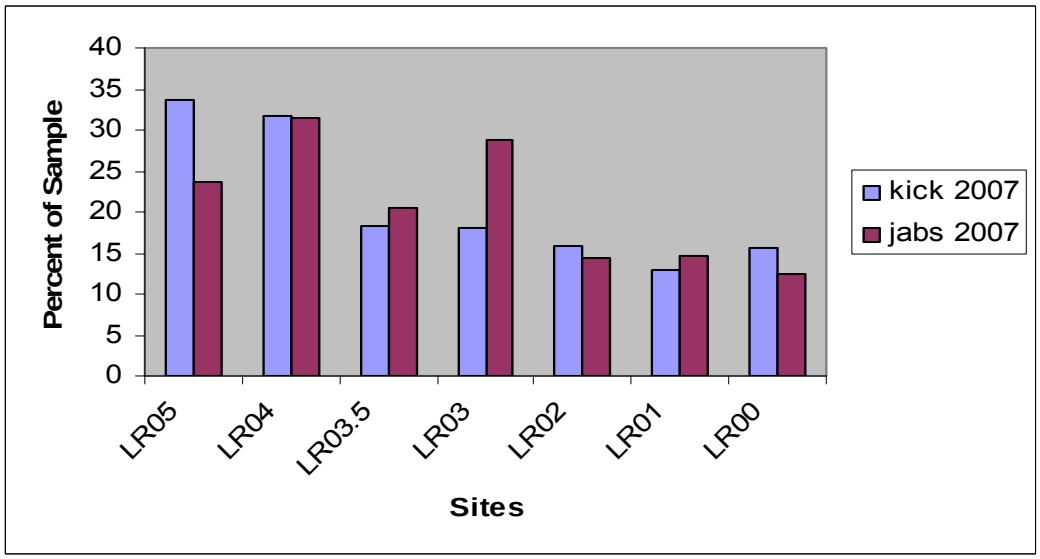

Figure 16. Percent Ephemeroptera (Mayflies) Lehigh River 2007

Percent EPT is a metric comparing the percentage of the taxa consisting of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) to the total number of organisms. A value around 55% would be indicative of a “balanced community” based on extensive field observations. In the tributary section of the report this metric was not employed due to the presence of large populations of hydropsychid caddisflies, particularly in the downstream sites which caused this metric to be misleading. Values in the kick samples ranged from 61% at LR04 to 82% at LR03.5 and 46% at LR02 to 72% at LR03.5 for the jab samples (Figure 17).

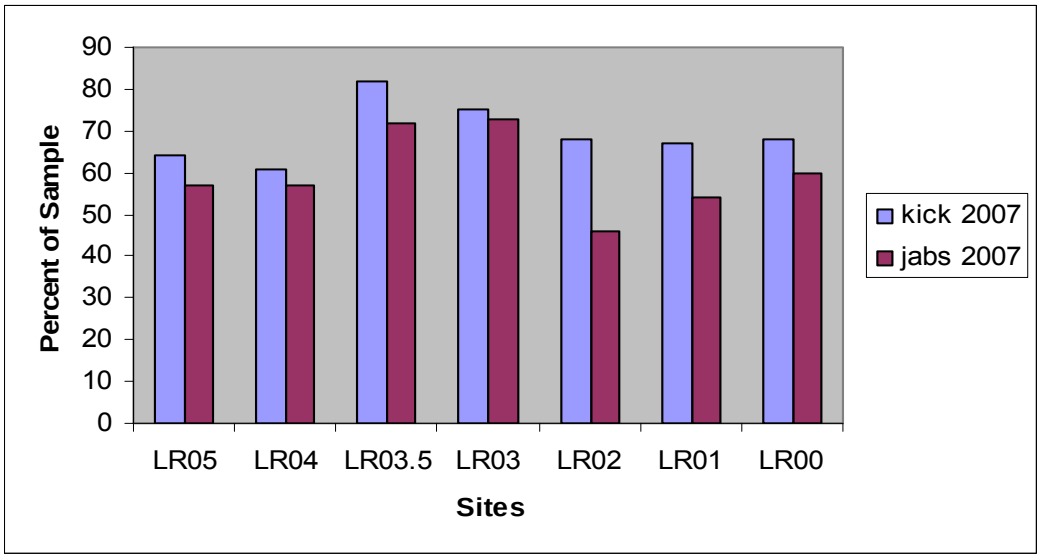

Figure 17. Percent EPT Lehigh River 2007

The percent hydropsychid caddisflies ranged from 11% at LR05 to 38% at LR03 for the kick samples and from 9% at LR00 to 32% at LR03 for the jabs (Figure 18). Perhaps the inflow of Aquashicola Creek along with the discharge of the Palmerton WWTP provided a rich source of particulate organic matter for the net spinning caddisflies in the vicinity of LR03. In addition, their metals tolerance likely promoted their abundance over less metals-tolerant taxa.

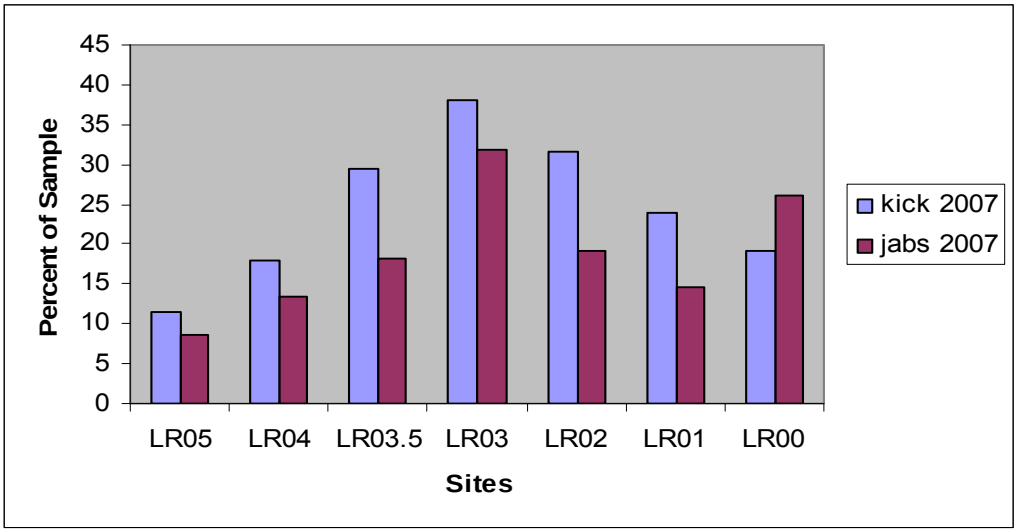

Figure 18. Percent Hydropsychid Caddisflies Lehigh River 2007

The percent tolerant taxa values ranged from 3% at LR05 to 8% at LR03.5 for the kick samples and from 8% at LR00 to 20% at LR02 for the jab samples (Figure 19). The results for LR02 showed that no tolerant taxa were collected there by kicks, yet 20% of the taxa were tolerant in the jab sample. It appears the presence of a large population of the tolerant snail *Physa* sp. was the cause.

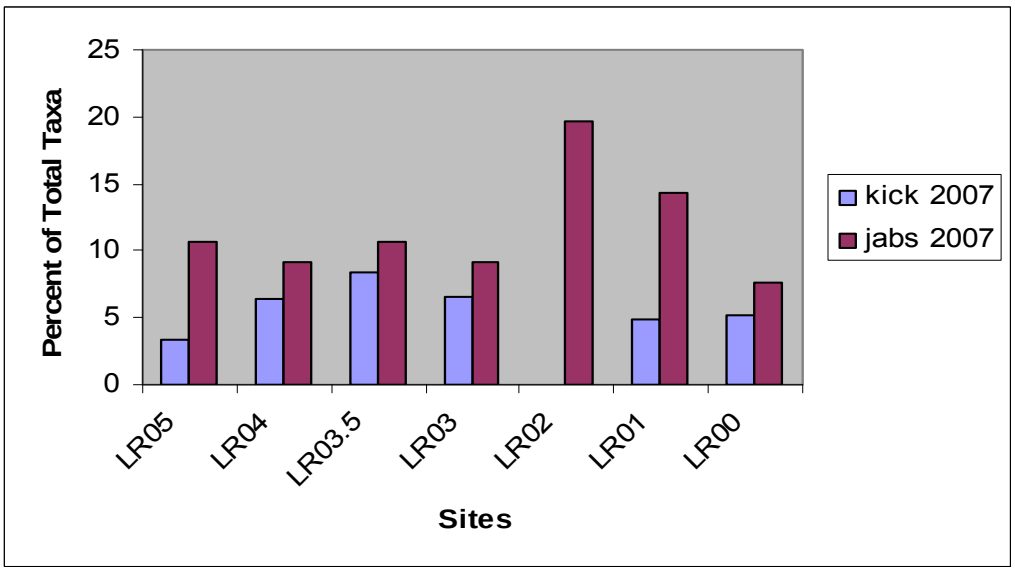

Figure 19. Percent Tolerant Taxa Lehigh River 2007

The percent collector values ranged from 49% at LR03.5 and LR01 to 65% at LR02 for the kick samples and from 48% at LR01 to 69% at LR03 for the jabs (Figure 20). Values <30% are considered supportive of a “balanced” community in lower order streams; however, a large stream like the Lehigh moves a tremendous amount of fine particulate organic matter, therefore, collectors are expected to increase in importance and dominate the assemblage. The slight increase in these organisms at LR03 over the other sites might be related to the inflow of additional organic particulates from the Palmerton WWTP.

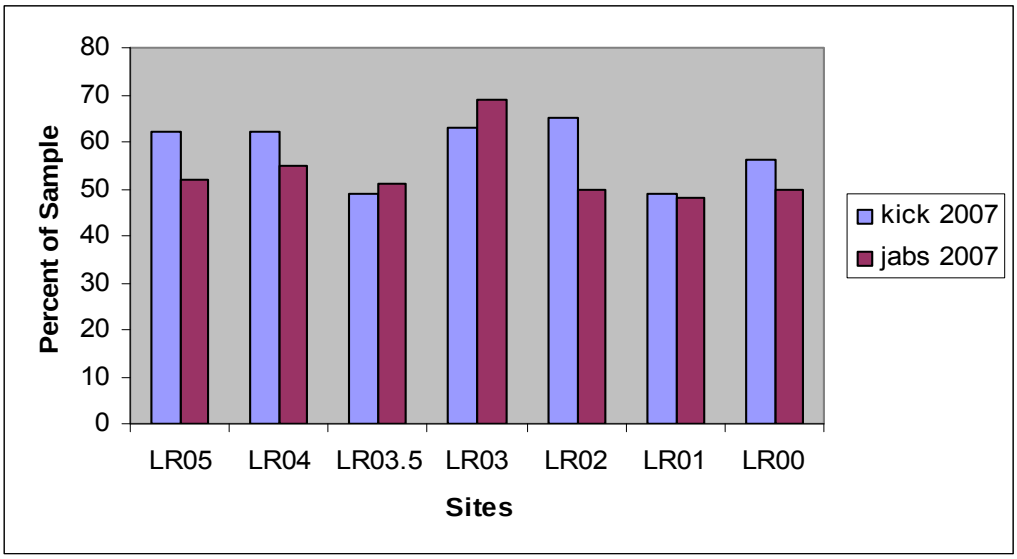

Figure 20. Percent Collectors (Filterers + Gatherers) Lehigh River 2007

The Shannon-Weaver Index H' (log2) values ranged from 3.43 at LR02 to 4.58 at LR04 for the kick samples and from 3.8 at LR00 to 5.06 at LR05 for the jabs (Figure 21). A value >3.0 is considered an indicator of good water quality in smaller streams and that value is exceeded at all Lehigh River sites. Overall, it appears the upstream reference sites have a slightly better index score.

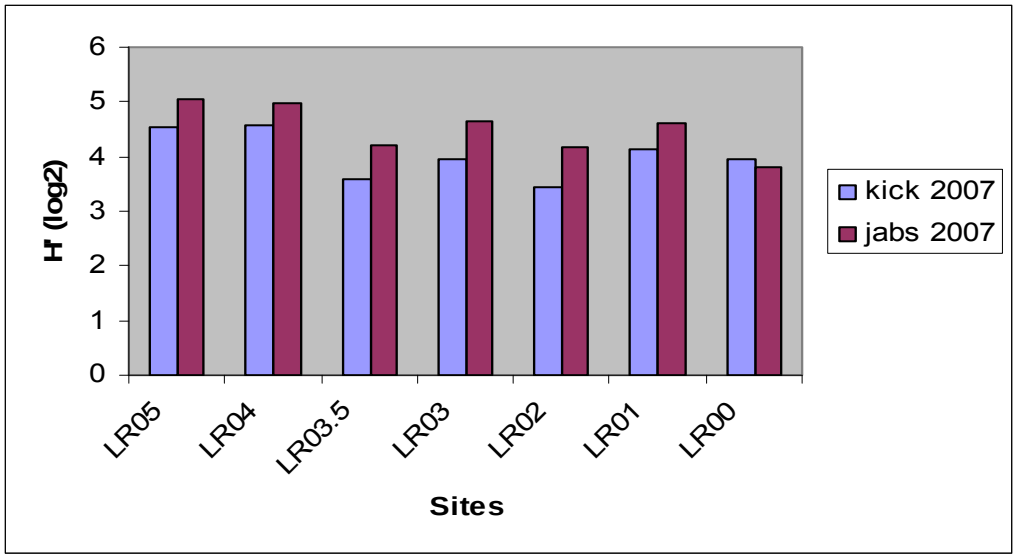

Figure 21. Shannon-Weaver Index H" (log 2) Lehigh River 2007

The Hilsenhoff scores ranged from 4.95 at LR03.5 to 4.54 at LR01 for the kick samples and 5.54 at LR02 to 4.71 at LR03.5 for the jab samples (Figure 22). The HBI scores at the upstream and downstream sites were slightly different in that they indicated "good" water quality with the exception of LR02 in the jab samples which rated "fair". These scores do not appear to show any real differences above or below the confluence of the Aquashicola Creek.

Figure 22. Hilsenhoff Biotic Index (HBI) Lehigh River 2007

Surface Water and Sediments- Tributaries 2006 and Lehigh River 2004

Although not part of the original scope of study of the aquatic communities of macroinvertebrates and periphyton, surface water and sediment data collected as separate efforts in the tributaries and Lehigh River were evaluated for their possible measurable impacts on the biota.

Sediment and surface water were sampled by BBL Science Arcadis in the fall of 2006 in Mill, Buckwha, and Aquashicola Creeks to provide data regarding the concentrations of metals in the vicinity of the Palmerton Zinc Pile Site (BBL Science Arcadis 2007) and to supplement sediment data taken in 2004 (Natural Resources Trustees 2007). Ten sites were sampled: one on Mill Creek (MC01), two on Buckwha Creek (BC10 and BC09), and seven sites (AC08 through AC04, AC03/02, and AC01) on Aquashicola Creek.

Methods of collection are outlined in the report; however, a brief description follows. Also recorded at each site were reach boundaries, qualitative descriptions of channel morphology, substrate composition, and habitat. Digital photographs were taken of the reach. A single water sample (one for filtered analyses and one for unfiltered analyses) representative of the reach was taken and three substrate samples were collected in a reach to capture conditions (total of 3 push cores and 27 rock scrapes). Along with water sample collection, an *in situ* water quality investigation was conducted for temperature, pH, conductivity, turbidity, dissolved oxygen, salinity, total dissolved solids, and oxidation reduction potential.

Soft sediments were collected by Lexan tubes pushed into the bottom sediments while coarse materials were scraped from large gravels and cobbles with a plastic spoon to obtain the required sample volume. Sediment compositions were recorded for each site.

Basic findings for the filtered water had many of the Target Analyte List (TAL) metals as non-detect. All detected metals were below the PA DEP Maximum Contaminant Levels (MCL), and zinc was the only metal that exceeded the USEPA Ambient Water Quality Criteria (AWQC) at (AC04, AC03/02, and AC01). For the unfiltered samples many TAL metals were also non-detect. Zinc was the only metal detected at concentrations exceeding the (AWQC). For manganese the PA DEP MCL was exceeded at AC04, AC03/02, and AC01.

For purposes of providing a preliminary screening of the data, the sediment data were compared to the consensus-based threshold effect concentrations (TECs) and consensus-based probable effect concentrations (PECs) developed by MacDonald *et al.* (2000). These values were developed based upon a review of previously existing sediment quality guidelines (SQG) derived from whole sediments throughout the United States, which might not be relevant to the site (especially for rock scrape data).

The sediment metals concentrations for nearly every sample exceeded the TECs and PECs at every one of the 10 sites in Mill, Buckwha, and Aquashicola Creeks. Cadmium and zinc were the metals that most commonly exceeded the screening criteria. Other metals in exceedence were chromium, copper, lead, and nickel. Scrape and tube samples at AC07 and AC08 were similar in metals concentrations.

In October 2004, a total of 57 sediment samples, plus 4 duplicates and 5 split samples were collected from the Lehigh River from Jim Thorpe downstream to Coplay and from the mouth of Aquashicola Creek upstream to Buckwha Creek and points upstream of Little Gap, PA. These samples were collected by the use of Lexan tubes and composited by depth integration and analyzed for total aluminum, arsenic, cadmium, chromium, copper, iron, lead, and zinc

(Palmerton Natural Resource Trustee Council 2007). Percent moisture, total organic carbon, and grain size were also analyzed.

Findings indicated that zinc likely caused the majority of toxicity reported in both the 2004 and 2006 studies. The area from the upstream end of the cinder bank to the mouth of the Aquashicola Creek had relative sediment toxicity considered high to very high. Moderate to high predicted zinc and cadmium toxicity were found to extend upstream in the Aquashicola Creek to near the confluence with Buckwha Creek at Little Gap extending downstream to the Lehigh River from the West Plant to Coplay. The east bank of the Lehigh showed higher zinc and cadmium results than the opposite bank adjacent to Palmerton.

The predicted sediment toxicity levels summarized by the Trustees in the reach from the cinder bank downstream to the confluence of Aquashicola Creek appears to be actual toxicity from the results of the macroinvertebrate, algal, and fish sampling where communities below AC04 are impacted. The predicted moderate to high zinc toxicity upstream in Aquashicola Creek to Little Gap near the confluence of the Buckwha Creek and downstream in the Lehigh River from the West Plant to Coplay was not as evident. In addition, further review of the predictive findings do not well define the differences in metals concentrations between the east and west banks of the Upper Lehigh River below the confluence of Aquashicola Creek and downstream to Coplay. Future sediment sampling should be designed to include sites that will indicate if a longitudinal downstream gradient of elevated metals concentrations exists between the banks and their extent below the confluence with Aquashicola Creek.

Fish Community- Tributaries and Lehigh River 2007

In June and July 2007, fourteen sites: one on Mill Creek, one on Buckwha Creek, five on Aquashicola Creek, and seven on the Lehigh River were collected for RBP habitat, fish community, fish tissue, and benthic macroinvertebrate tissue levels (Palmerton Natural Resources Trustee Council 2008). A reference site for tissue concentrations in fish and macroinvertebrates was located on Mahoning Creek.

The study objectives were to:

- Evaluate the current level and extent of contamination of aquatic habitat and injury to aquatic life resulting from site-specific metals contamination
- Characterize the species diversity and abundance of the fish community at upstream reference stations, stations adjacent to, and downstream of the Site
- Characterize metals concentrations in aquatic life at the stations where fish community surveys occurred
- Correlate the results of the fish community study, metals concentrations in aquatic life, metals concentrations of sediment and habitat scores
- Collect current aquatic habitat data to be used to revise the USEPA (2001) Ecological Risk Assessment (ERA)

The findings indicated that there were considerably less fish/ha at AC01, AC03/02, and AC05, all located either adjacent to or downstream of the cinder bank and Site. AC01, AC03/02 and AC05 had the highest fish tissue and invertebrate zinc concentrations versus AC06, AC08, and BC10. In the Lehigh River species diversity was higher upstream of the confluence with the Aquashicola Creek than downstream. The highest fish tissue zinc concentrations were found below the confluence with the Aquashicola at LR03. Invertebrate tissue (*Hydropsyche*) zinc concentrations were higher downstream of the confluence. Detailed descriptions of the results are in Palmerton Natural Resource Trustee Council (2008).

Zinc Sediment and Tissue Concentrations and Effects on the Macroinvertebrate and Fish Communities- Tributaries and Lehigh River

Although the impacts to the aquatic communities in the tributary streams and Lehigh River caused by metals concentrations are not limited to only zinc there is evidence that zinc occurs in the highest portion of samples (Palmerton Natural Resources Trustees Council 2007). Based upon this knowledge zinc was chosen to represent the effects of the suite of metals occurring in these systems. In the tributary streams the zinc values were generated by the fall 2006 study while the Lehigh River values were part of the fall 2004 study. Site locations for the 2006 study were closely coordinated with the biological studies; however, the Lehigh River 2004 sites were a “close match” to the biological collection sites.

As stated previously the peer-reviewed literature seems in some agreement that measures of benthic macroinvertebrate taxa richness or the abundance of metals-sensitive taxa provide the most sensitive and reliable measure of community level effects. The following graphs employing the 2006 kick sample data appear to reflect that premise in that the total species richness and mayfly richness values declined with increased sediment zinc concentrations in the tributary streams (Figures 23 and 24). In Figure 25, the graph shows the increase in the metals-tolerant hydropsychid caddisflies below the cinder bank.

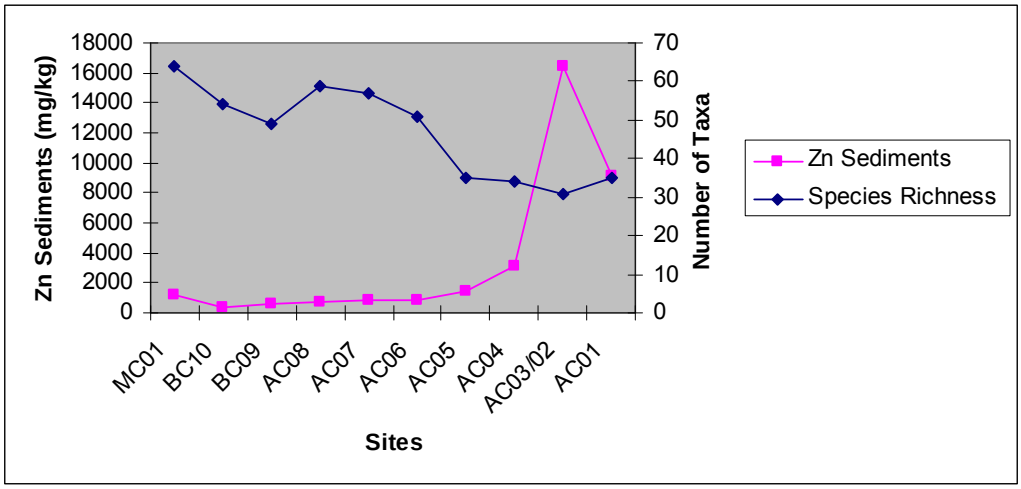

Figure 23. Zinc Sediment Concentrations and Macroinvertebrate Species Richness Tributary Sites

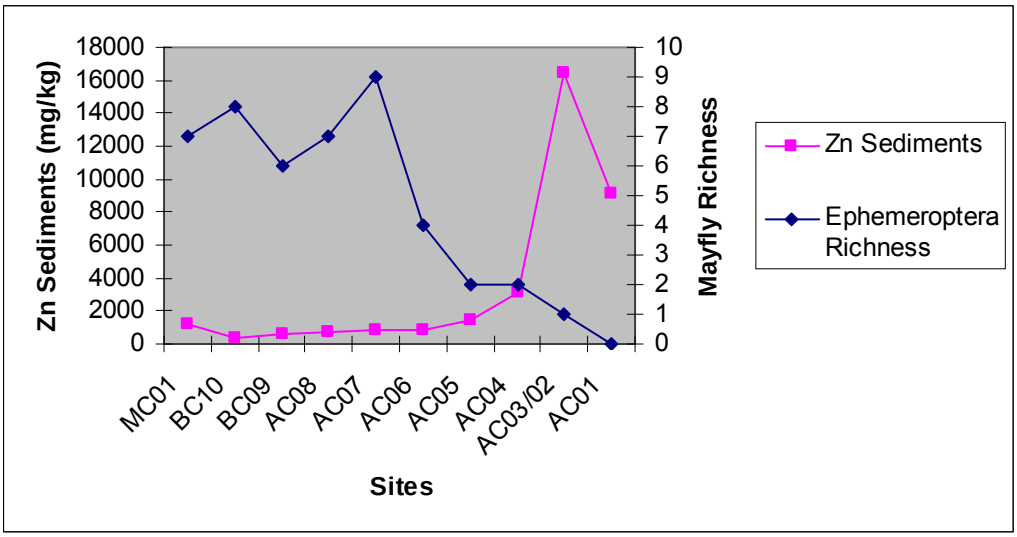

Figure 24. Zinc Sediment Concentrations and Ephemeroptera (Mayfly) Richness Tributary Sites

Figure 25 shows the relationship between the metals-tolerant hydropsychid caddisflies and the higher zinc sediment concentrations to the exclusion of the metals-sensitive taxa. It is certainly obvious that the hydropsychid caddisfly percentage spiked along with the zinc concentrations.

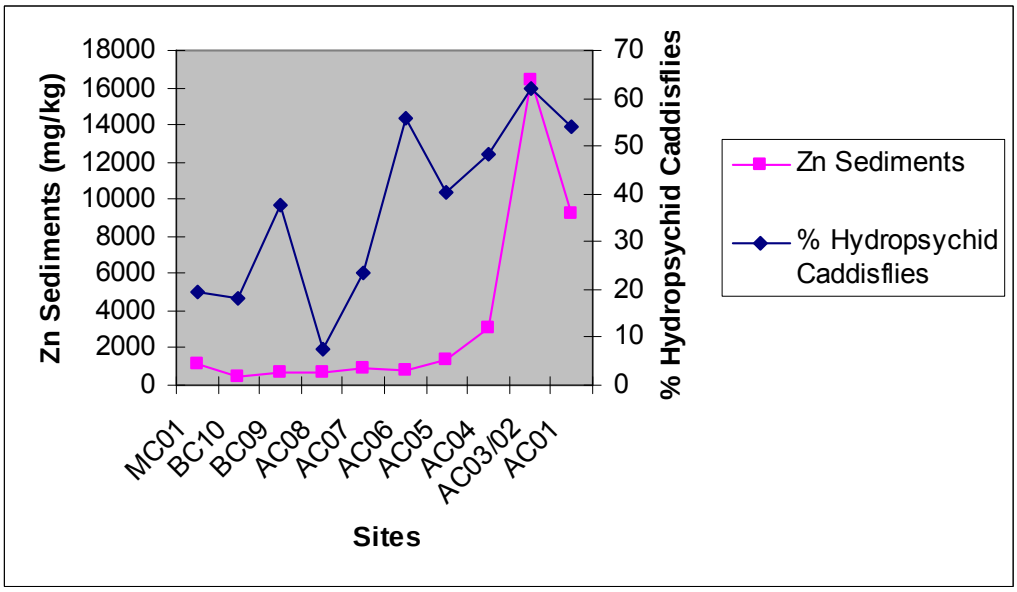

Figure 25. Zinc Concentrations in Sediments and Percent Hydropsychid Caddisflies Tributary Sites

An important question to answer in the case of elevated metals concentrations is the actual bioavailability of those metals to the benthic macroinvertebrates. In the case of the hydropsychid caddisflies, which are efficient organic particulate feeders, there appears to be a relationship between the zinc sediment values and the tissue values (Figure 26).

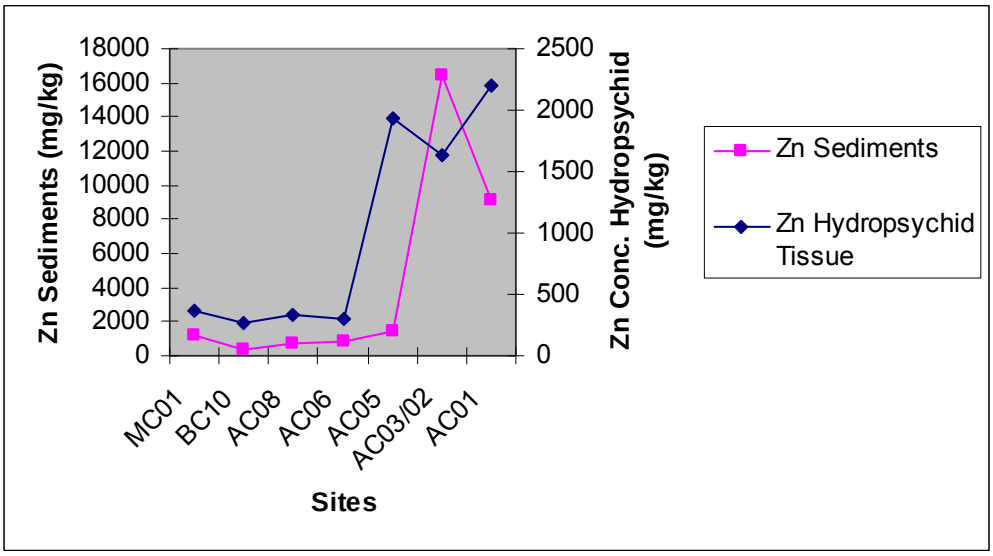

Figure 26. Zinc Concentrations in Sediments and Hydropsychid Caddisfly Tissue Tributary Sites

Although slightly out of the scope of this study, which centers on benthic macroinvertebrates and periphyton, it is important to understand the transport of these metals in the food chain and how they affect community structure at the apex level. Figure 27 clearly shows a fish community with greater numbers per hectare above the cinder bank area and an abrupt decline below the cinder bank extending to the confluence. Zinc concentrations in the sediments peak at AC03/02 at the point of greatest decline for fish numbers. The habitat scores do not seem to indicate reaches are unfavorable for fish to thrive.

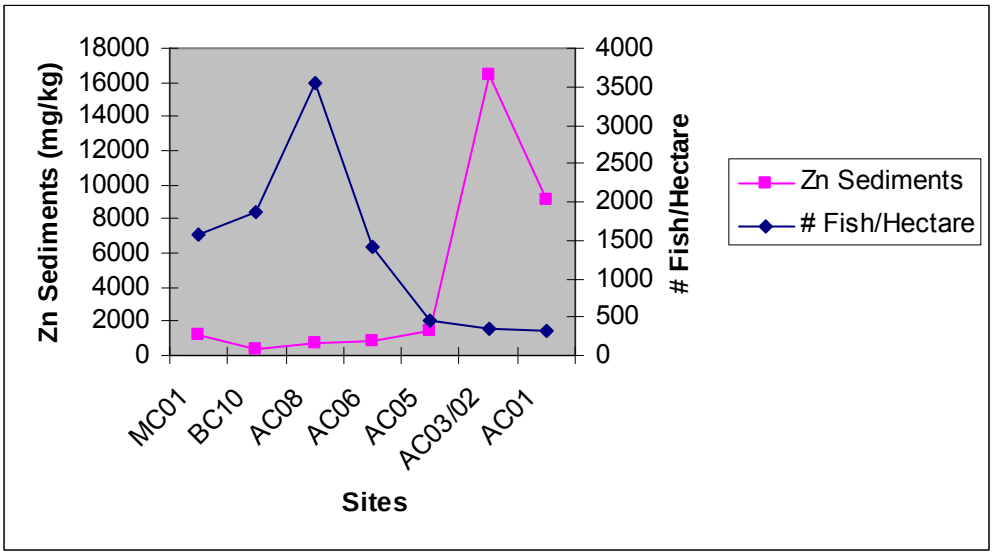

Figure 27. Zinc Concentrations in Sediments and Fish Community Tributary Sites

Zinc concentrations in the sediments seem to closely mirror the concentrations (average) in fish tissue (Figure 28). The response is similar to that of the hydropsychid caddisflies in that body burdens increased below AC05.

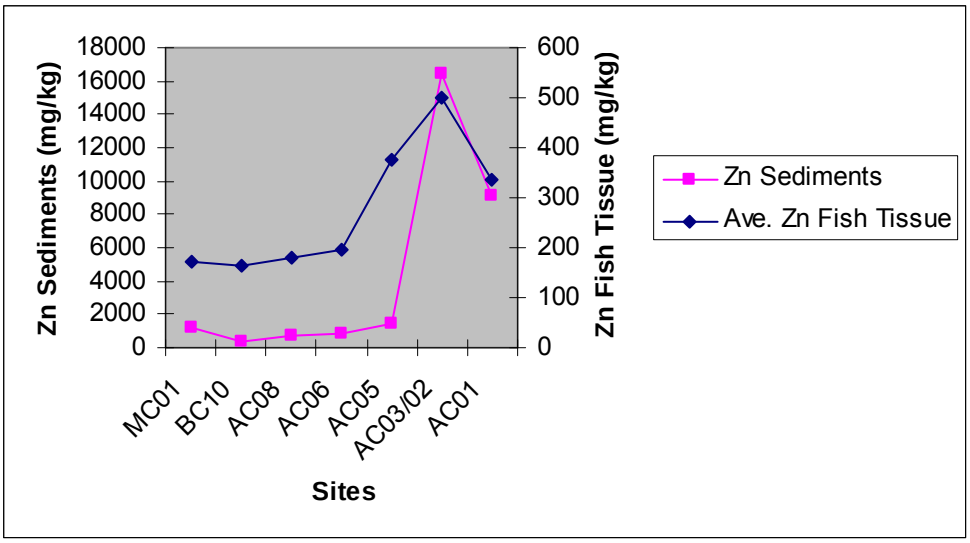

Figure 28. Zinc Sediment and Average Fish Tissue Concentrations Tributary Sites

The Lehigh River stream size, ecosystem structure, and function obviously differ from the lower order tributary streams previously discussed. Community structure in the large rivers is driven by factors such as a reduction in the variance of diel temperature, riparian influence, substrate, flow, and food changing in a predictable downstream fashion both absolutely and in terms of the relative heterogeneity of each (Vannote *et al.* 1980). In regards to metals toxicity responses, the macroinvertebrates inhabiting the river also have representatives of the same metals-tolerant and intolerant taxa; however, if the source of bioavailable metals is, in fact, thought to be principally the inflow from Aquashicola Creek the effects might well be more localized with sediments deposited downstream on the Lehigh along the east bank. The 2007 kick sample data were used for the analysis.

Species richness in the Lehigh River was highest above the confluence with the Aquashicola Creek with values tending to decrease downstream (Figure 29); however, a value of 46 at LR03 does not represent an impacted community. It is possible that the riffle areas sampled by both the kick and jab methods were not directly within the plume of the inflow of Aquashicola Creek. The drop in species richness to 28 at LR02, some eleven kilometers downstream of LR03, along with the lowest zinc sediment concentration of 140 mg/kg is not easily explained. The zinc sediment concentration spiked at 6100 mg/kg at LR03 at the confluence with Aquashicola Creek.

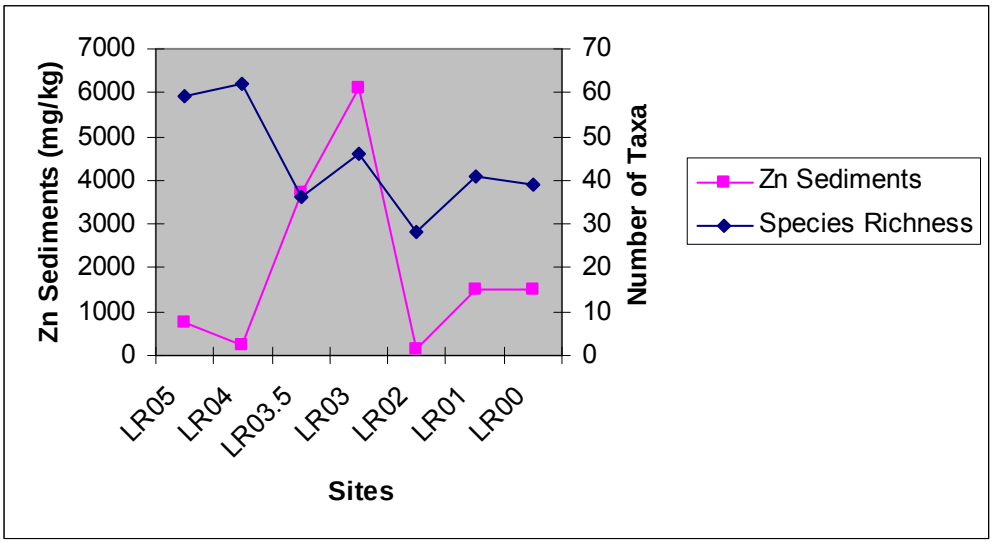

Figure 29. Zinc Sediment Concentrations and Macroinvertebrate Species Richness Lehigh River

Unlike the response in the Aquashicola Creek, below the cinder bank the Ephemeroptera richness values did not crash at or below LR03 with a high spike in zinc concentration but instead incrementally declined downstream to LR00 and were not impacted by zinc sediment concentrations. Even though the metals-tolerant baetid mayflies were dominant at LR03 and downstream there were sensitive mayfly taxa present at these sites. At the two reference sites upstream of LR03 there was a relationship between mayfly richness and zinc sediment concentrations (Figure 30).

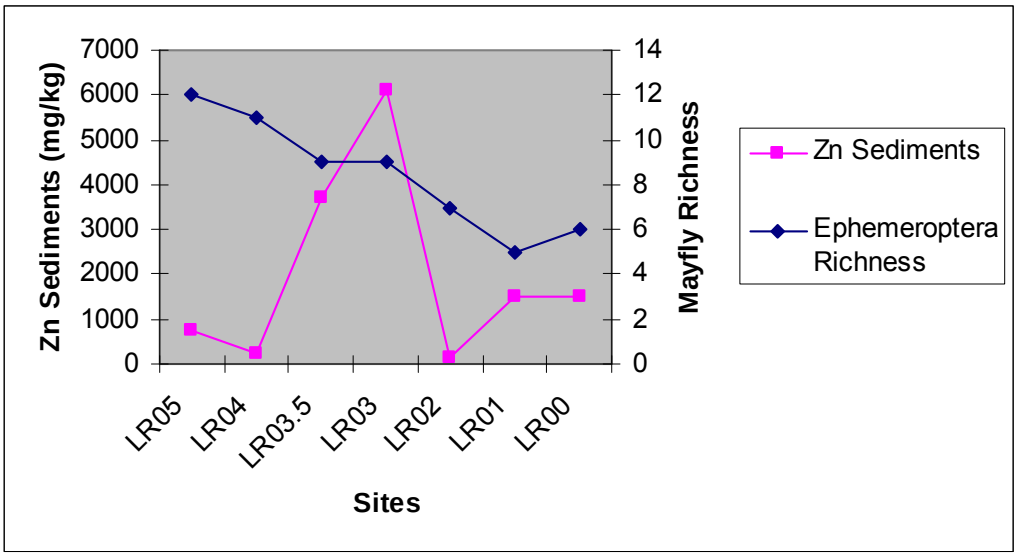

Figure 30. Zinc Sediment Concentrations and Ephemeroptera Richness Lehigh River

The hydropsychid caddisflies are considered metals-tolerant and often dominate communities exposed to metals contaminants. At the confluence of the Aquashicola Creek, LR03 shows the hydropsychids make up a significant portion of the community and almost represent a “bell curve” from upstream to downstream occurrence (Figure 31). The high percentage of the caddisflies may be in part due to the inflow of an organic particulate rich food source from the WWTP in Palmerton as well as the ability to tolerate the associated metals attached to the organic matter.

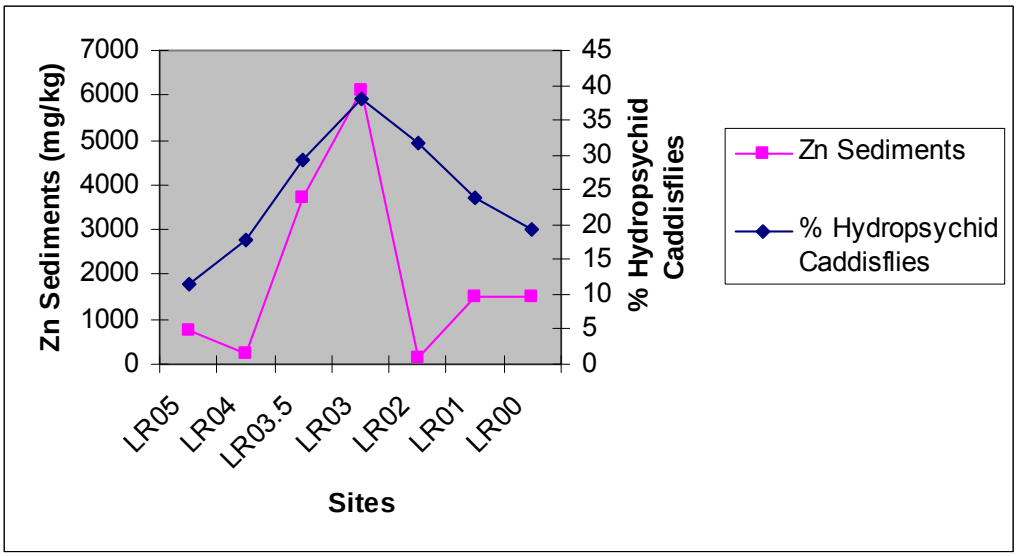

Figure 31. Zinc Sediment Concentrations and Percent Hydropsychid Caddisflies Lehigh River

From the data it appears that there is an increase in zinc concentrations within the whole body hydropsychid caddisflies downstream of LR03. The fact that tissue concentrations were lowest upstream and continued to increase downstream as far as LR00 indicate that the Aquashicola Creek inflow is suspect as a zinc source (Figure 32).

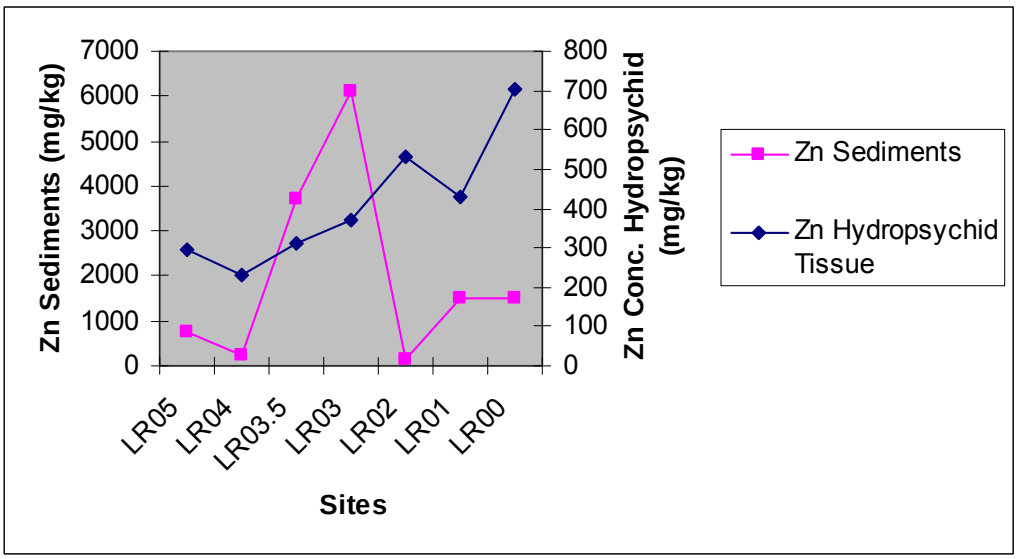

Figure 32. Zinc Concentrations in Sediments and Hydropsychid Caddisfly Tissue Lehigh River

The total number of fish taxa collected by shock boat differed upstream and downstream of LR03 with the average number of taxa above the confluence of Aquashicola Creek at 13.3 and below at 9.7. The tote barge collection revealed an average number of taxa of 11.3 above the confluence, and an average of 12.3 below the confluence. Combining both fish collection methods shows an average number of 18 taxa above the confluence and 15.7 below. The species composition differed among the study sites in that below the confluence with the Aquashicola Creek there was a reported decrease in abundance of white sucker and other benthic feeding species (Figure 33).

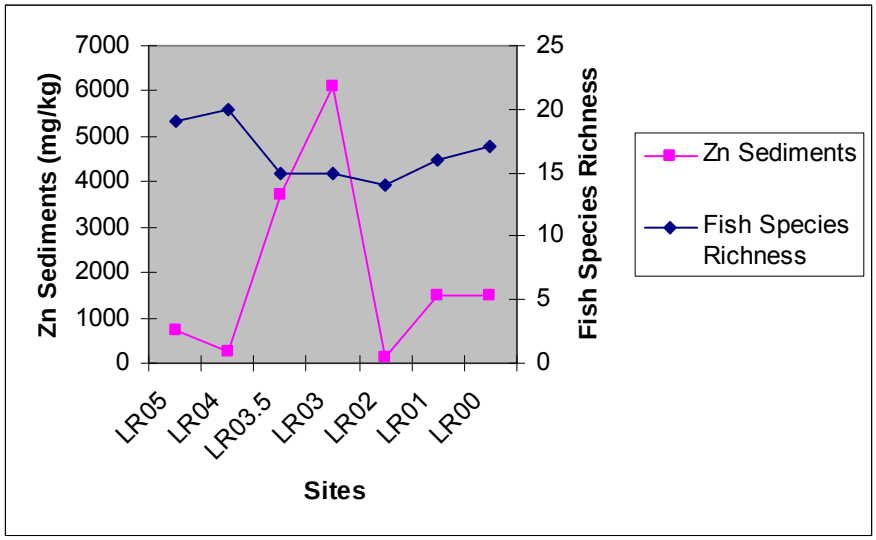

Figure 33. Zinc Sediment Concentrations and Fish Species Richness Lehigh River

The zinc concentration in sediments and average zinc in fish tissue were the highest at LR03 (Figure 34). Unlike macroinvertebrates, fish are mobile and some of the predatory species tend to move long distances within the river. The fact that measurable zinc concentrations occur in fish tissue at all sites is as or more notable than at which particular site has the higher concentrations.

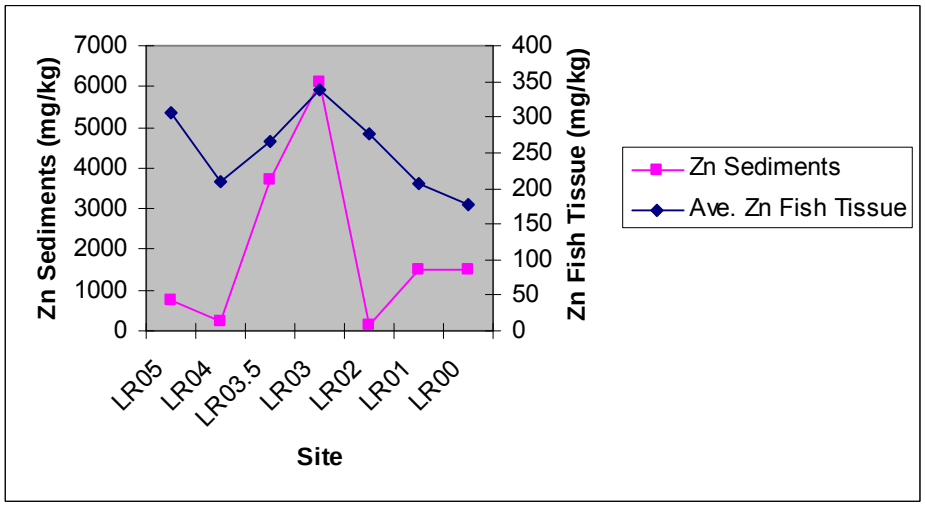

Figure 34. Zinc Sediment and Average Fish Tissue Concentrations Lehigh River

Algal Community

Mill, Buckwha, and Aquashicola Creeks 2006-2007

Algae have been shown to uptake large quantities of heavy metals (Le Faucheur *et al.* 2006). *Lyngbya, Oscillatoria*, and *Scenedesmu*s have all shown significant measured uptake of metals (Gold *et al.* 2002). Some of the diatom taxa have demonstrated malformation in frustule formation as a result of metals exposure (Rushforth *et al.* 1981). Also, assemblages of diatom communities have been shown to undergo diversity changes as a result of metals exposure (Deniseger *et al.* 1986). Biomass decreases with high levels of heavy metals particularly zinc (Genter *et al.* 1987). With O*scillatoria*, there is a correlation between the low level of flow, algal concentration, and the amount of heavy metals absorbed (Le Faucheur *et al.* 2006).

In 2006, collections were completed during high water conditions. Difficulties with sample collection because of the high water conditions and the vandalism of equipment at several sites made a comparison of the two years of data somewhat difficult. The 2007 collections were the complete opposite of the previous year. The drought was extensive and water that was over 5 feet deep (flood stage >8 feet) the previous year (at both USGS gages at Lehighton and Walnutport, S.J. Ward, pers. com.) was measured in inches for the 2007 collections. A complication of the 2007 collections was evidence of some kind of unknown stressor that was introduced into Aquashicola Creek just above sampling site ACO4. The algae were peeling from the rocks in sheets and the macroinvertebrate community demonstrated reduced abundance. The periphytometers had slow recovery rates and low density.

There was a drop in species richness at most sites from 2006 to 2007. In 2007 there was an increase in the number of pollution tolerant taxa and a drop in the intolerant taxa. At ACO4 there was an increase in brackish-fresh taxa that was not observed in 2006.

At AC01 the change in flow was dramatic compared to that of 2006. The Margalef's richness was the same both years. The AFDW (Ash Free Dry Weight) showed a significant drop from 2006 to 2007 (Figure 35 and 36). ACO2/03 shows the same drop in flow, taxa richness, and density when a comparison of 2006 and 2007 was made.

AC04 saw a drop in the Shannon Weaver Index, Percent Sensitive Taxa/Intolerant Taxa Ratio, and AFDW when comparing 2007 to 2006.

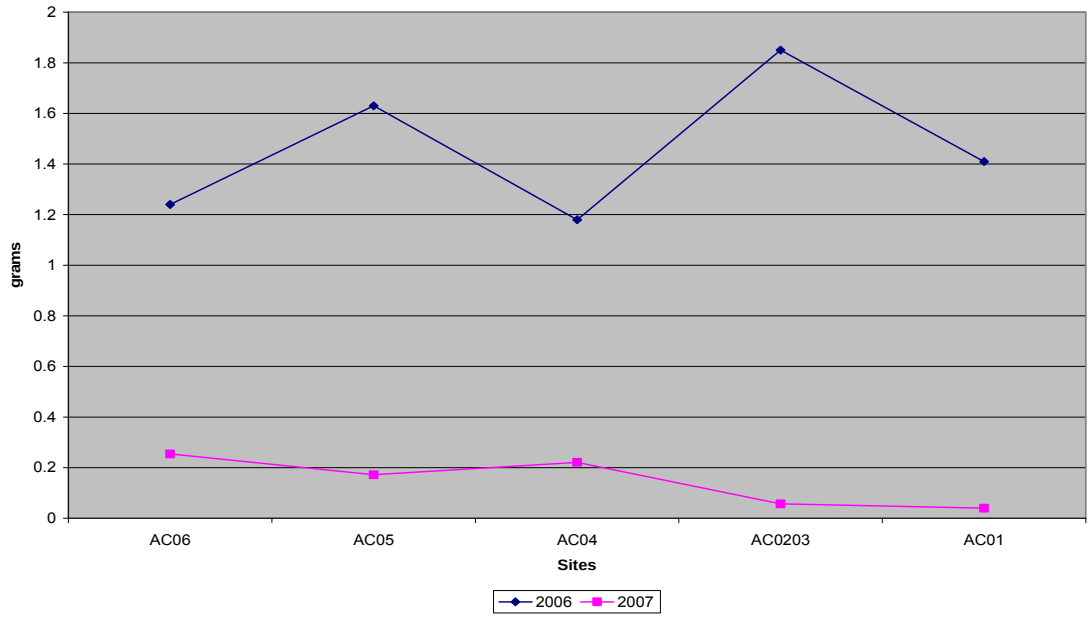

Figure 35. Ash Free Dry Weight (AFDW)

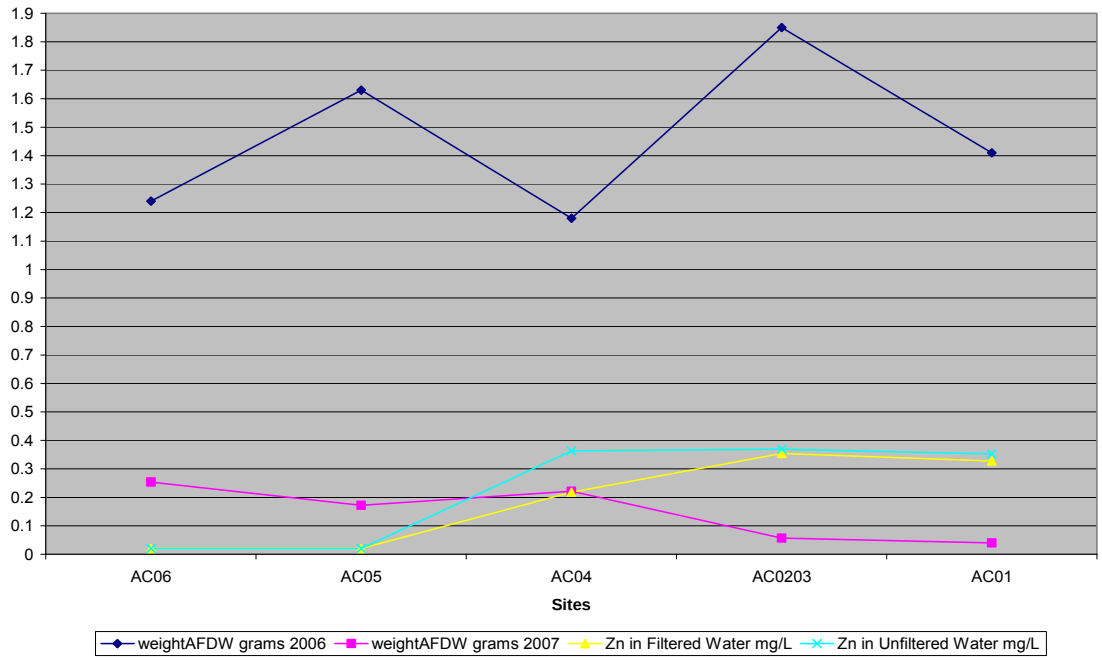

Figure 36. AFDW and Zinc Levels in Water

The change at AC05 from 2006 to 2007 was great. There was a large drop in the AFDW, taxa richness, and flow. The drop in AFDW and taxa richness is not easily explained because there were no other substantial changes (other than flow) observed by PA DEP at this site. The flow difference between the two years was extreme. It is difficult to determine what a normal flow would be when the two years of study only demonstrated extremes. ACO6 data were

representative of what should happen to a creek at low flow, with all other conditions being the same.

Algae at AC04 had contact with a high level of zinc (Figure 37). This site demonstrates the lower AFDW which would directly correlate to a lower biomass present as discussed in Gold *et al.* (2002). This does not explain the higher biomass at AC02/03 in the presence of an even higher zinc level. The rock scrape measurements at those sites were high in zinc (Figure 38). The *Scenedesmus* count was extremely high at ACO2/03 and AC01 as larger and more complex algae they could account for the higher biomass. *Scenedesmus* acts as a collector of zinc and may provide for some detoxification of the location (Le Faucheur *et al.* 2006). As the zinc measurements indicated the difference was displayed downstream to the confluence with the Lehigh River. The difference is greater during the low flow of 2007, but was still measurable during the high flow season of 2006. There would be a more direct correlation if there had not been some sort of unexplained and uninvestigated event at AC04. The water concentration was low; therefore, there was more impact by the metal on the growth of the algae (Genter *et al.* 1987).

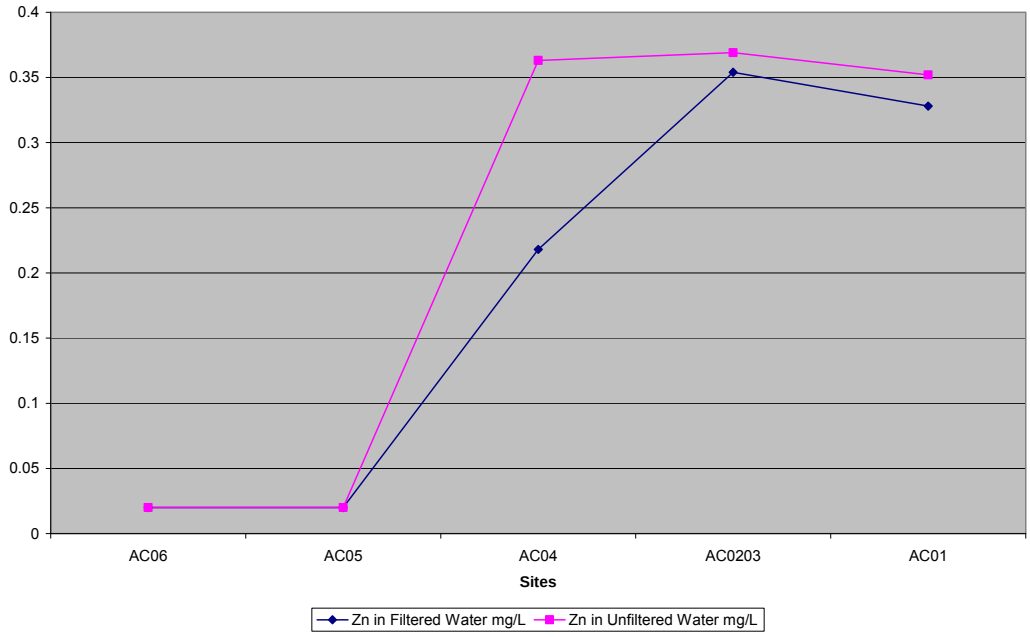

Figure 37. Zinc in Water Samples

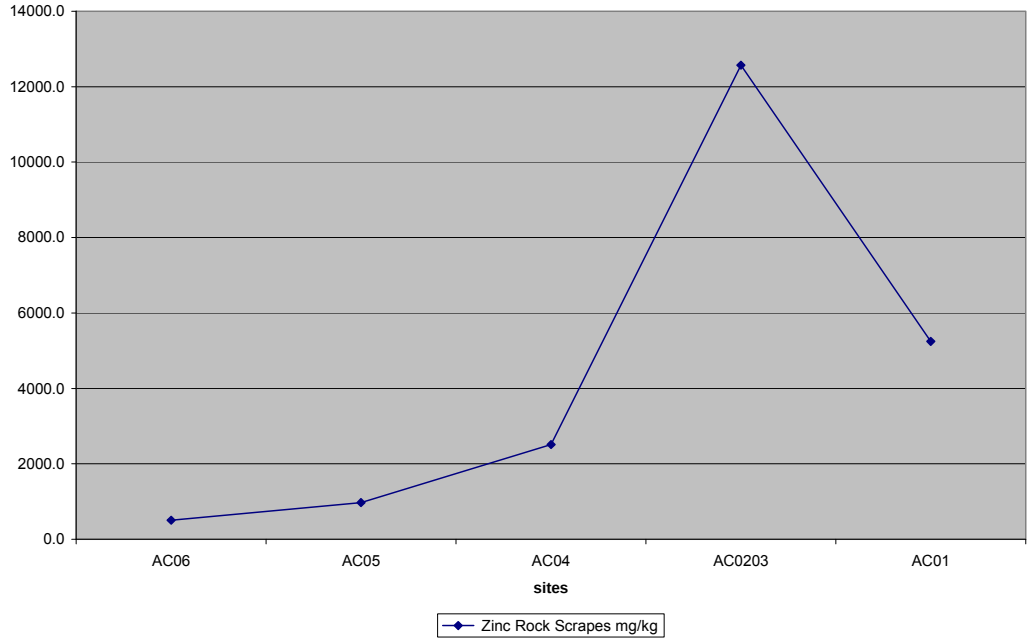

Figure 38. Zinc Rock Scrapes (mg/kg)

The effects of Aquashicola Creek at the confluence with the Lehigh River were quickly dissipated. Any changes it caused disappeared by the next collection site downstream.

The pigments tell the story of high water versus drought conditions (Figure 39). Chlorophyll A, which indicates the amount of algal growth in a quantitative and comprehensive measure was relatively constant in 2006 at all sites, but in 2007 there was a significant drop at AC06 and the sites downstream. The pheophytins which indicates the amount of cyanobacterial (blue-green algal) growth drop to a low level after AC06, but are constant downstream. Chlorophyll C, which indicates diatom growth, is also at a low level after AC06. There does not seem to be a relationship between the zinc levels and the pigments that are present, other than high zinc and low levels of pigments.

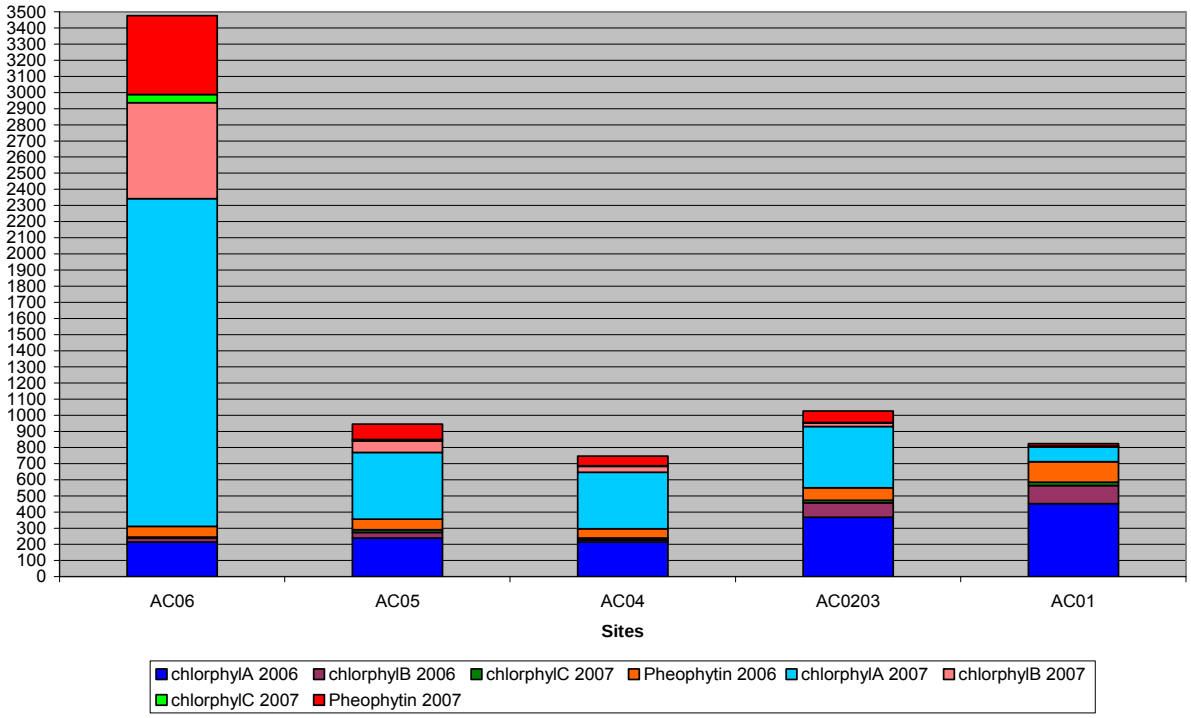

Figure 39. Pigments

Lehigh River 2007

There were no real overall conclusions to be drawn about the Lehigh River because there was only one year of data collected. The low flow of the Lehigh River concentrated and isolated the effects. As human impact increases and low flow conditions exist there will be a concentration of that effect in the immediate area which will not be passed further downstream. When a river is at an average flow there will be dilution of effects and the materials will be moved further downstream. The good news of low flow is that these materials will not affect the lower reaches of the river. However, the bad news is that there will be a concentration effect that will increase the damage in a localized area. The other problem with the data was that the river was in a severe stress situation. A comparison of the rock scrapings to the periphytometers indicated that there was large taxa diversity available for deposition and growth. The differences in samples were that the rock scrapings demonstrated the competition of the algae over time compared to the pioneer growth of the periphytometers. Rocks will have several life cycles of algal taxa on the surface referred to as biofilm. As the stream dries it will form a biofilm refuge for algal taxa until better flows are present which provides conditions to reseed the system.

CONCLUSIONS

A study of the water quality, habitat, and benthic macroinvertebrate and periphyton communities was initiated in the fall of 2006 and continued into the summer of 2007, in the vicinity of the Palmerton Zinc Pile Superfund Site, Palmerton, PA. The purpose of this study was to determine if aquatic benthic macroinvertebrate and periphyton community composition was impaired in the area affected by site related contaminant releases and to determine if the function of the aquatic communities were impaired in the same area.

Data collection at 10 sites was conducted in October 2006: one site on Mill Creek, two on Buckwha Creek, and seven on Aquashicola Creek. In August 2007, 12 sites were sampled: five repeated sites on Aquashicola Creek to document differences in high/low flow conditions between the years and seven sites on the main stem Lehigh River. These sites were selected with the technical assistance of the Trustees to include areas upstream and downstream of the confluence of Aquashicola Creek with those sites upstream considered out of the influence of the Site and those downstream within the area of Site impact. In addition, these sampling sites corresponded with previous collections conducted at these or nearby locations. The methods of collection, laboratory processing, and data calculation and analysis used in this study closely followed established protocols in order to reduce or eliminate questions of variability.

In order to better define the conditions at each site an *in situ* water quality analysis, habitat scoring, and substrate particle size characterization was conducted. Since the bioavailability of metals like zinc in the environment are affected by low pH, low alkalinity, low dissolved oxygen, and high temperatures in lotic systems those parameters were closely examined. The habitat scores were overall in the optimum to suboptimum range for most sites and the particle size distribution favored a cobble substrate. None of these factors were considered limiting to successful aquatic community composition within the tributary streams or the Lehigh River.

Benthic macroinvertebrates have been used extensively to monitor the effects of metals contamination on aquatic systems by demonstrating both individual and community responses. A set of 10-11 metrics was chosen based on their history of use in defining the health of communities dealing with metals contaminants covering richness and dominance measures, community composition, functional feeding group composition, and diversity and biotic indices. A range of metrics were employed since not all macroinvertebrate assemblages will react to every metric in “textbook” fashion. In Mill, Buckwha, and Aquashicola Creeks the richness metrics-total species, EPT, and mayflies all showed a healthy macroinvertebrate community upstream of AC05 and highly impaired community richness values downstream to AC01. The single taxon percent dominance increased downstream of AC04 adjacent to the cinder bank with the metals-sensitive mayfly taxa basically disappearing downstream of AC04. On the other hand, the metals-tolerant hydropsychid caddisflies increased dramatically in abundance below AC04 making up ~80% of the community in the 2007 kick samples at AC01. This condition was also seen in the percent tolerant taxa metric which was >20% at AC01. The percent collector metric scores showed the presence of a community made up of a significant number of organisms adapted to feed on organic particulate matter. The diversity and biotic index metrics were not as useful in determining impairment scoring falling within “very good” to “good” assessment categories.

An analysis was performed following the PA DEP antidegradation methods to discover how the benthic communities compared to an upstream reference site thought to be located out of the area of possible impairment by the Site. Buckwha Creek (BC09) was chosen as the reference and was the same site used by PA DEP in 2001. The results showed the sites upstream of AC05 to be 100% of the reference condition (BC10, AC08, AC07, and AC06). The sites below AC05 (AC04, AC03/02, and AC01) declined in percent of reference score (from 80% at AC05 to 33% at AC01) which mostly mimicked those results from 2001.

In August 2007, the Lehigh River was sampled for benthic macroinvertebrate communities at seven sites covering a longitudinal design both above and below the river's confluence with Aquashicola Creek and analyzed by employing the same set of 10 metrics used in the tributary streams assessment plus percent EPT. The analysis was a bit more difficult than that completed on the lower order streams due to the complexities of the larger ecosystem and the fact that macroinvertebrate community data from other similar systems in the mid-Atlantic area is not common in the literature. The richness values for total taxa, EPT, and mayflies trended toward a higher value upstream of the Aquashicola Creek confluence site LR03 and a decline downstream to LR00. Percent dominant taxon, percent EPT, and percent tolerant taxa metrics were not very useful in describing impairment; however the percent mayflies did decline below LR03. Diversity values for both Shannon-Weaver Index and Hilsenhoff Biotic Index were indicative of "good" water quality except for LR02 which ranked "fair". The percent collector's metric was not as useful in the larger river since the communities tend toward the collectors in natural systems although the trend was toward a slight decrease below the confluence. The percent metals-tolerant hydropsychid caddisflies might hold the most interesting result in that they peaked at 38% at the confluence site and slightly declined downstream to LR00.

Sediment samples were collected in the fall of 2004 and surface water and sediment samples in the fall of 2006 on the tributary streams along with macroinvertebrate and fish tissues by BBL Science Arcadis. Sediments were also collected on the Lehigh River in 2004 by BBL. The findings showed that fish and macroinvertebrate tissue concentrations for zinc were highest below AC05 and that the fish community also had less fish below AC05. In the Upper Lehigh River, the hydropsychid caddisfly tissue levels were higher for zinc downstream of the confluence with Aquashicola Creek, whereas, the average fish tissue concentrations for zinc, while measureable, declined below LR03. In addition, fish species diversity was greater upstream of the confluence.

An analysis of the zinc sediment data (zinc was chosen since it was the metal most frequently found in the greatest concentration) was performed on a subset of the metrics used previously. In the tributary systems the reduction in species richness and mayfly richness appeared to be highly correlative with the higher zinc sediment concentrations. The percent metals-tolerant hydropsychid caddisflies and the caddisfly tissue values also were highly correlated with sediment zinc concentrations. An examination of the fish community data and average fish tissue levels for zinc strongly showed a drop in fish numbers and an increase in tissue levels below AC05.

The interpretation of the periphyton data was particularly confounded by the significant differences in flow between the collection years. Nevertheless, AC04 saw a drop in the Shannon Weaver Index, percent sensitive taxa/intolerant taxa ratio, and AFDW. A large drop in the AFDW and taxa richness was not easily explained. Sites above AC06 appeared to be unimpaired.

The results from these studies were highly representative of the exhaustive studies done on the Palmerton Zinc Pile Site by USEPA in the late 1990's and early 2000's in that taxonomic diversity and numerical abundance was reduced for both benthic macroinvertebrates and fish below the cinder bank area (AC04). The periphyton taxa richness and AFDW were reduced below AC04 in the current study which closely compared to the USEPA study where the numbers of periphyton taxa were lower in the smelter area than at the reference sites. Below AC04, sites exhibited lower AFDW which directly correlated to a lower biomass. The higher biomass at AC03/02 was not explained; however, the *Scenedesmus* count was extremely high, and as larger and more complex algae they may add to the biomass. The Lehigh River results revealed the only impact was at the confluence with Aquashicola Creek. There did not seem to be a relationship between the zinc levels and algal pigments present.

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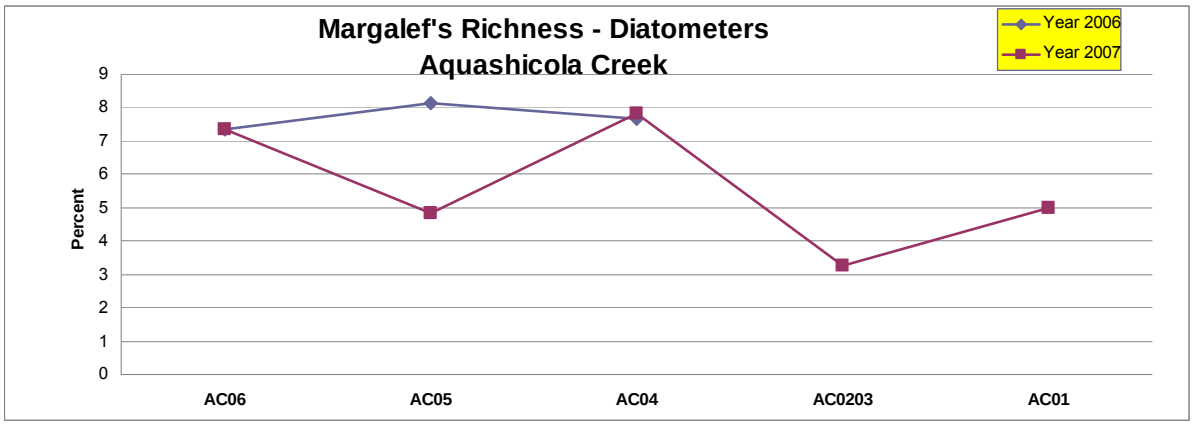
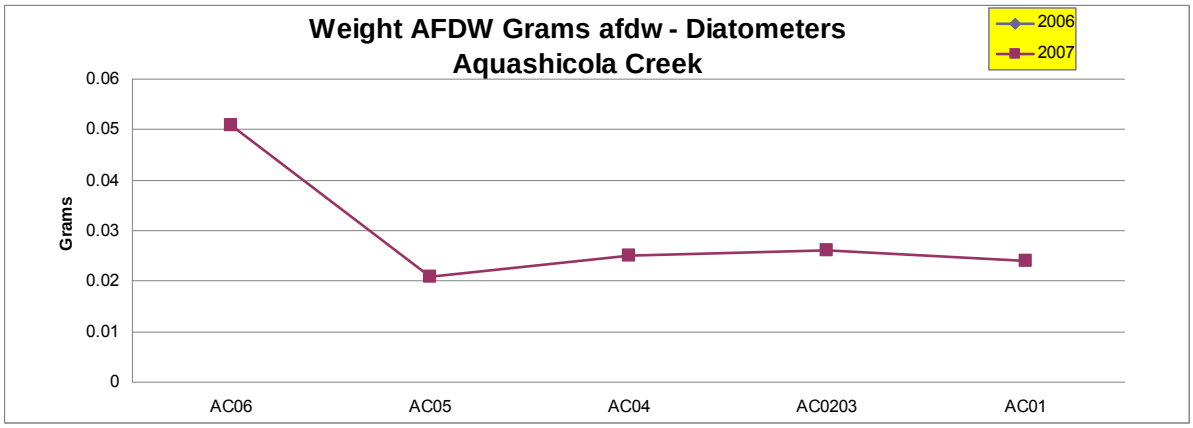
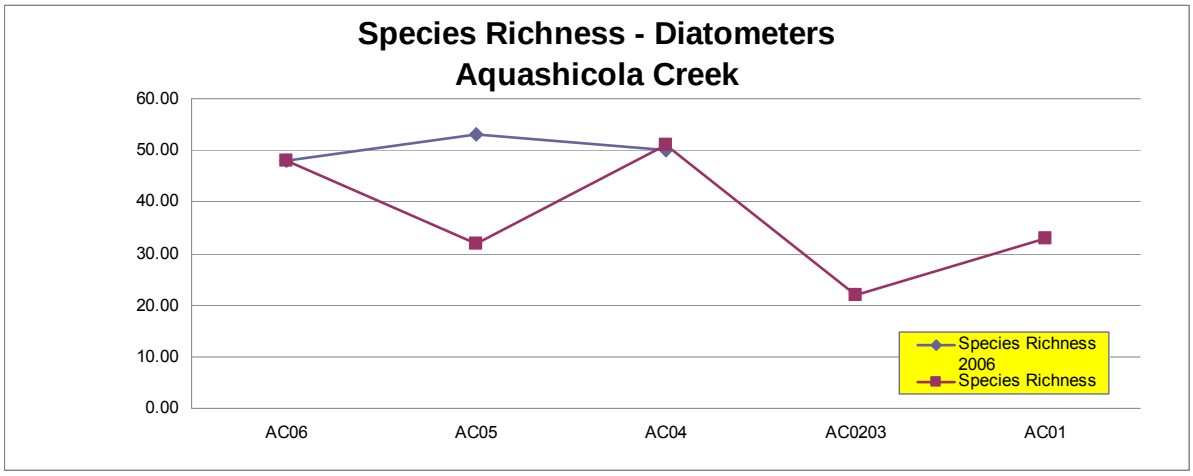
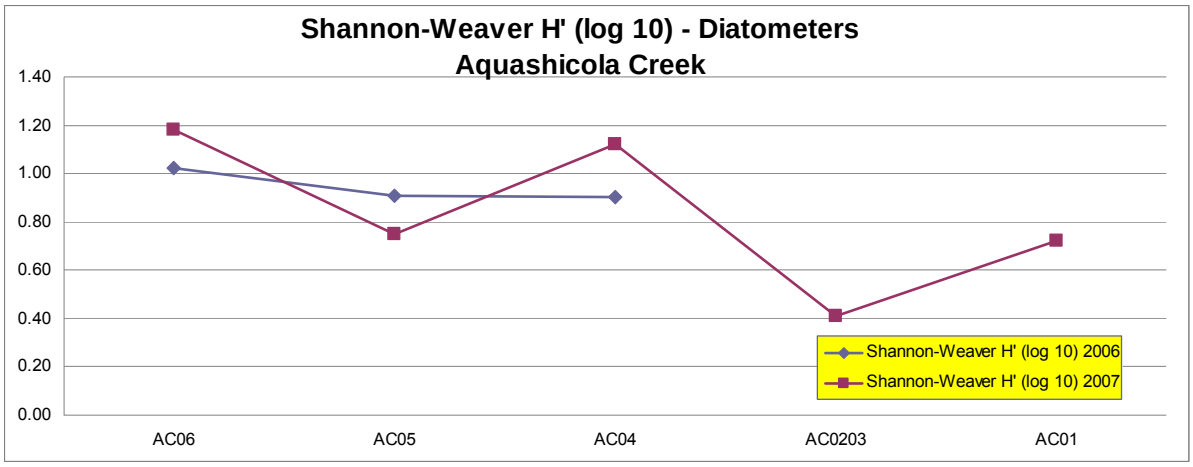
APPENDIX 1. Periphyton Community Graphics

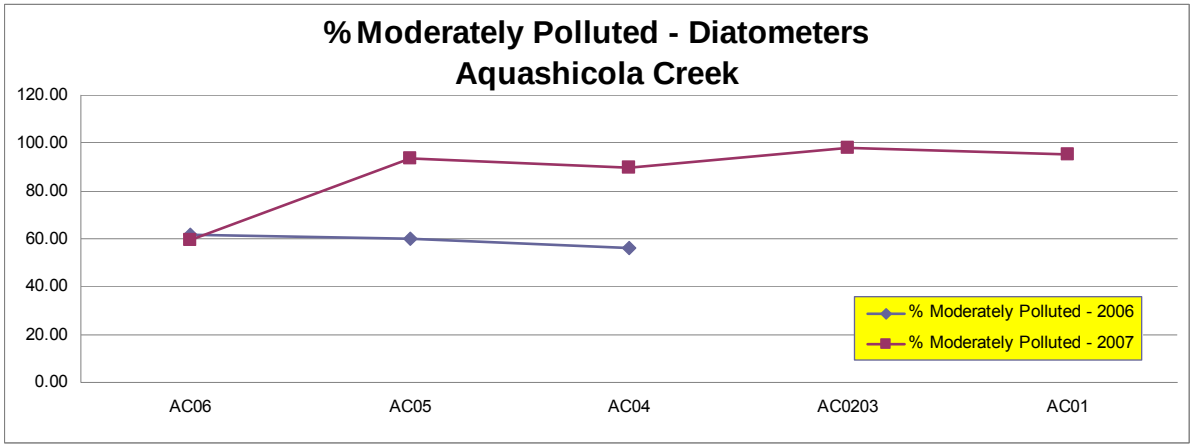




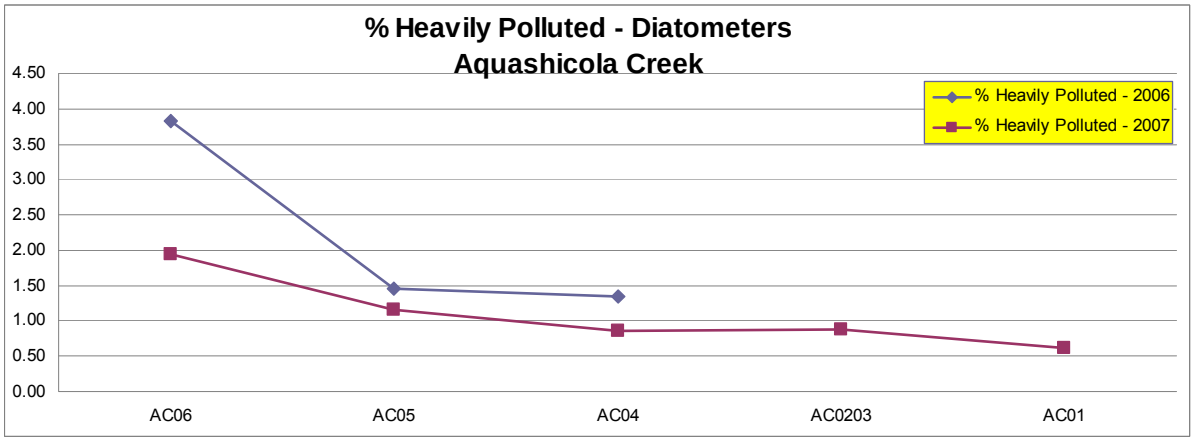
There was a drop in biomass collected from site AC06 to AC05. This indicates that some type of stressor(s) were present in the stream.



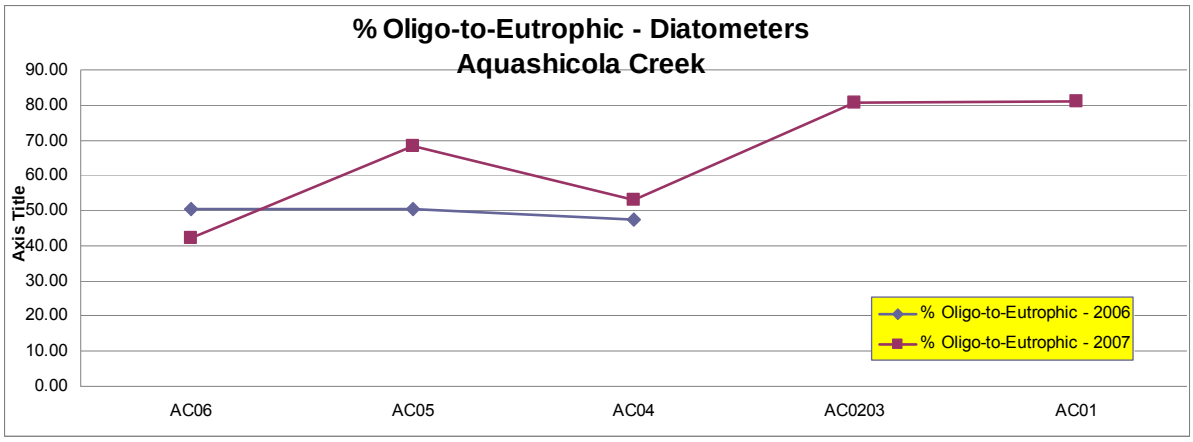




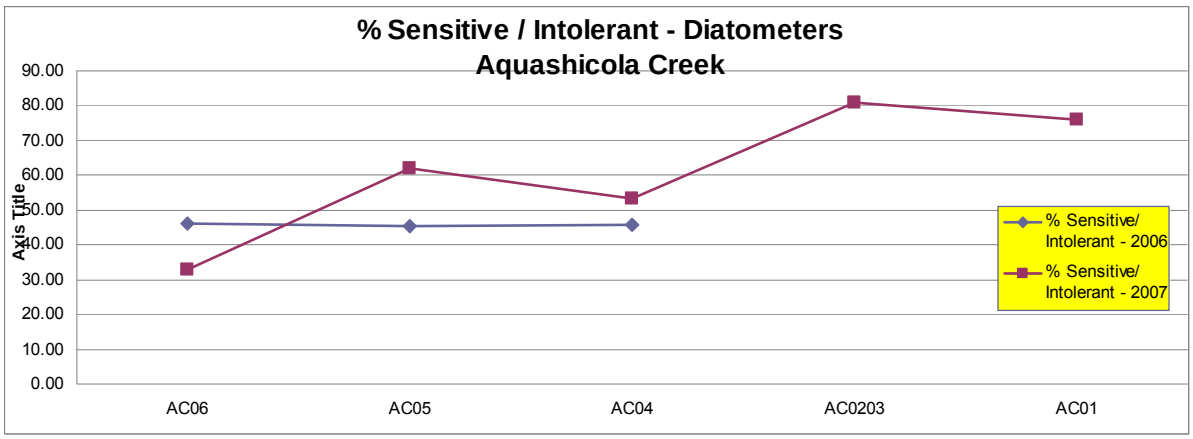
There was an increase in the diatom taxa identified from the moderately polluted group during 2007. The change occurred between sampling site AC06 and AC05 in 2007. The three sites collected in 2006 do not show any changes occurring.



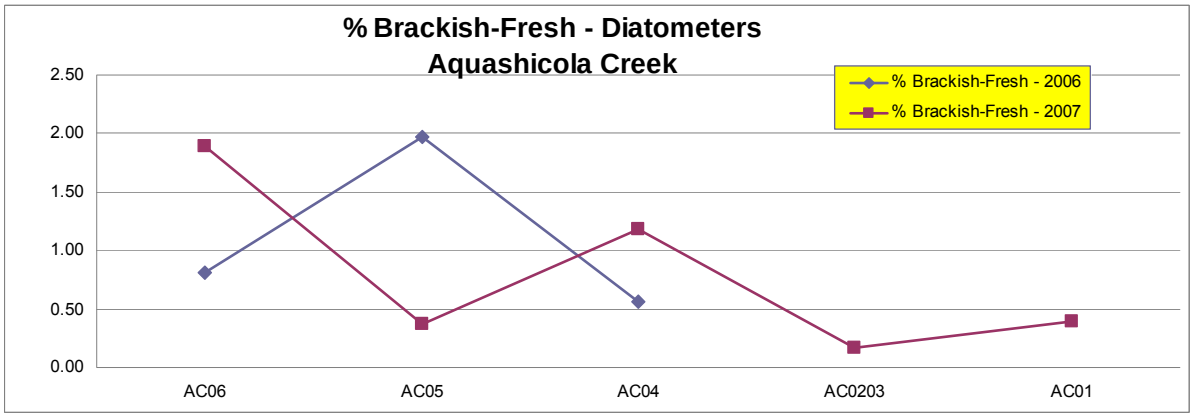
There was a decrease from 2006 to 2007 in the diatom taxa from the heavy pollution group identified. This would indicate that the change demonstrated in the preceding graph was not eutrophic in nature.



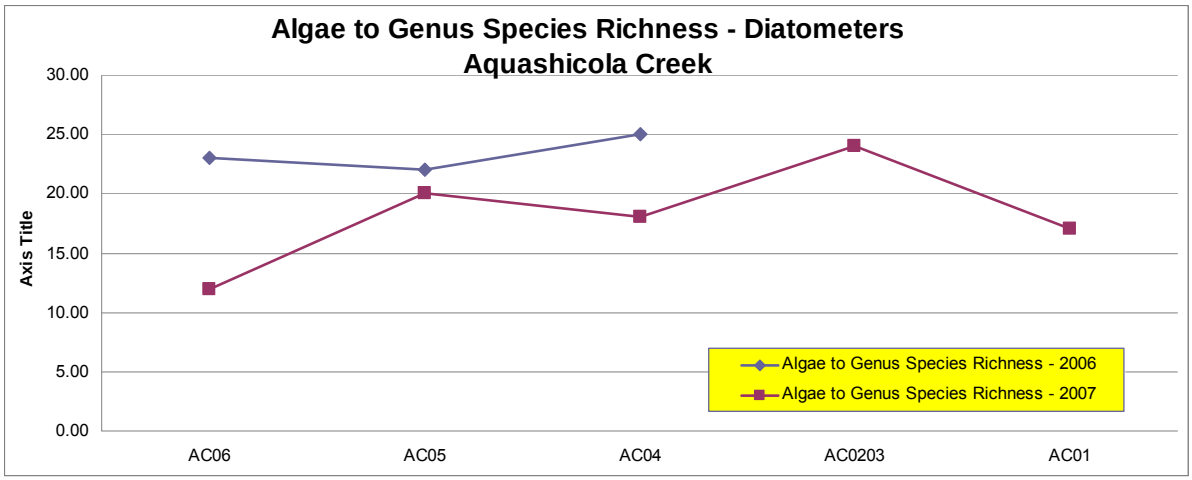
Oligotrophic diatom ratio to eutrophic diatom taxa in 2006 was constant. In 2007, there was an increase in the ratio which would indicate an increase of nutrient addition to the stream.



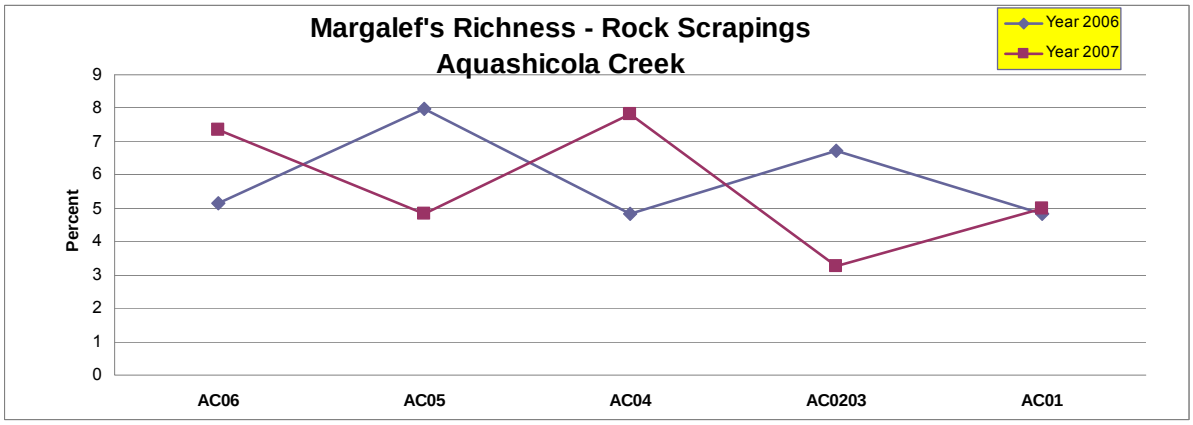
There is an increase in the taxa of diatoms that are sensitive or intolerant to pollution in 2007 from site to site when compared to the constant levels in 2006.

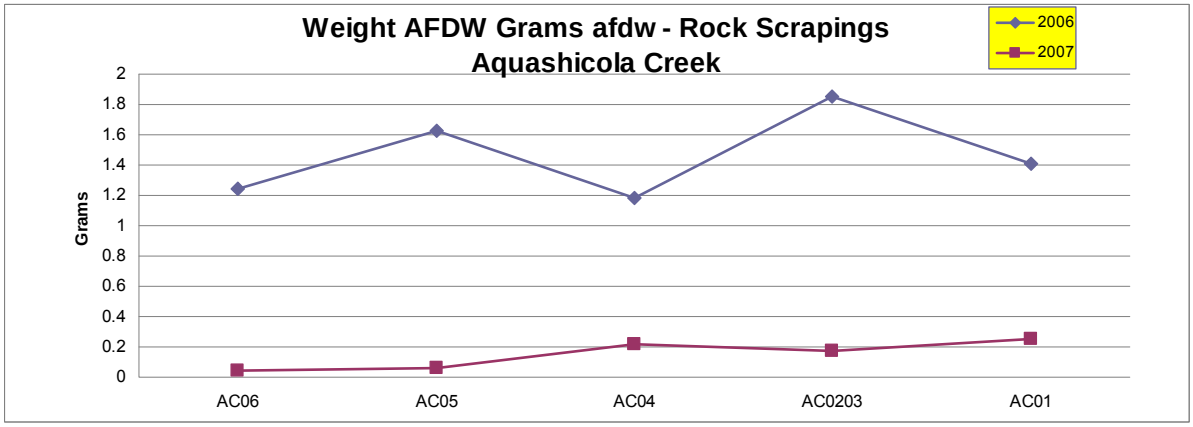


There is a large change of taxa at site AC05 from 2006 to 2007. A specific group of taxa are no longer at this site.

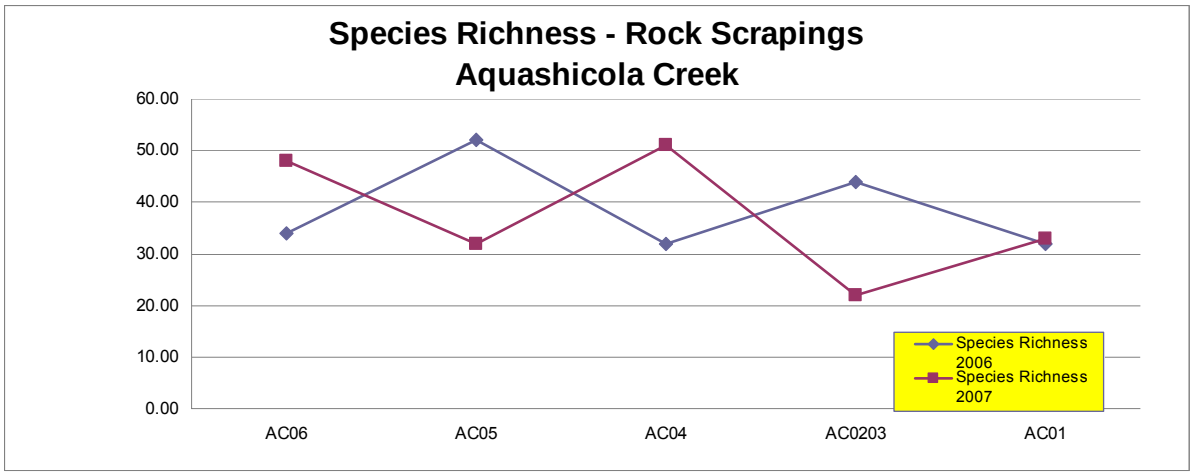


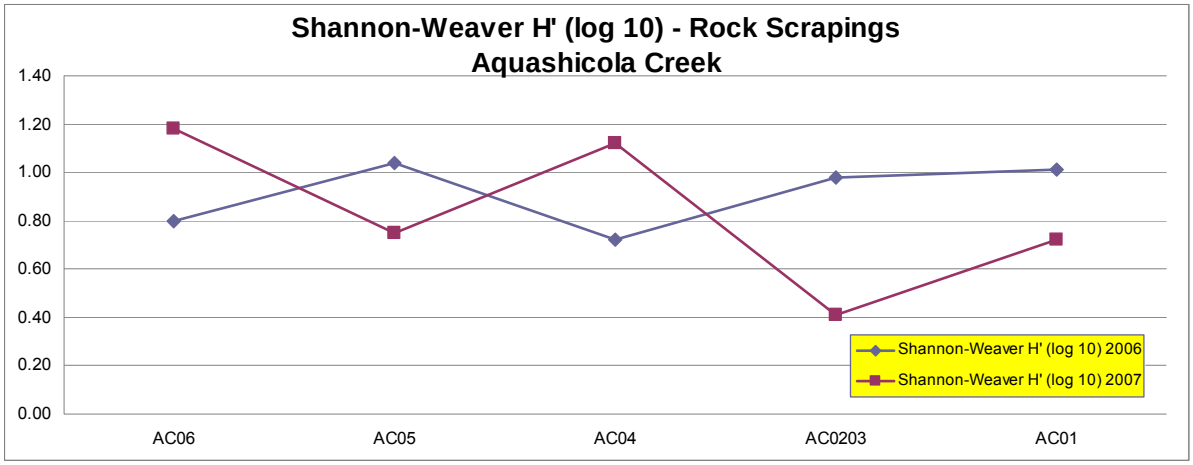
The year 2006 was more diverse in available taxa than in 2007.

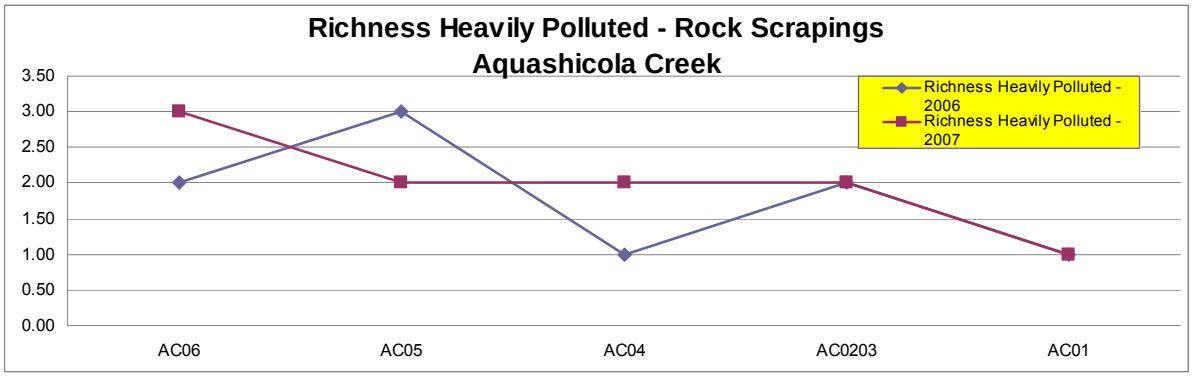




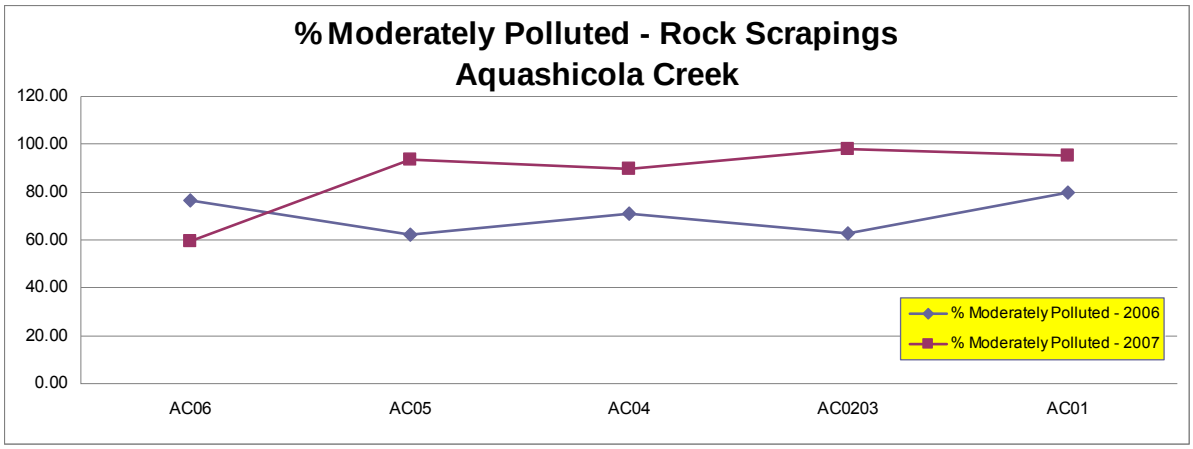
The biomass was much lower at all sites in 2007 when compared to 2006. This could be a drought effect.



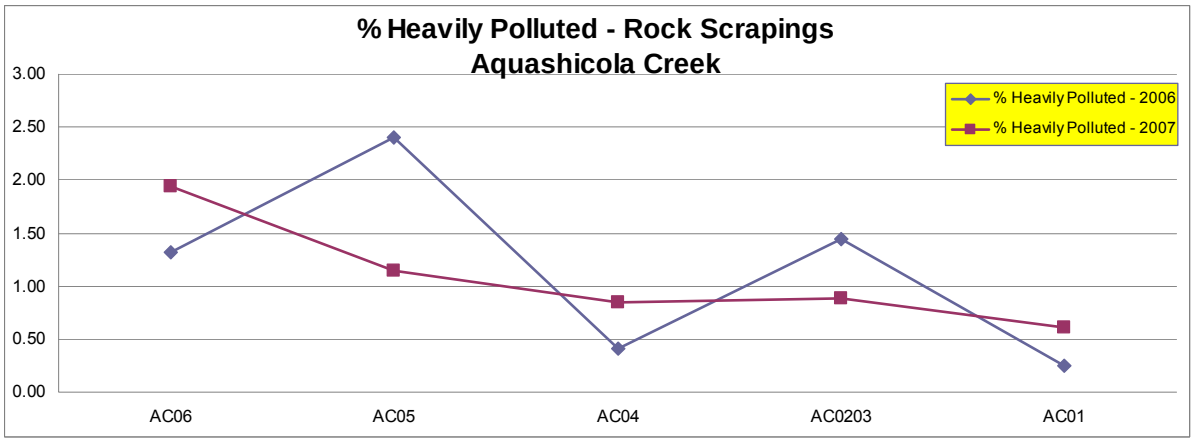




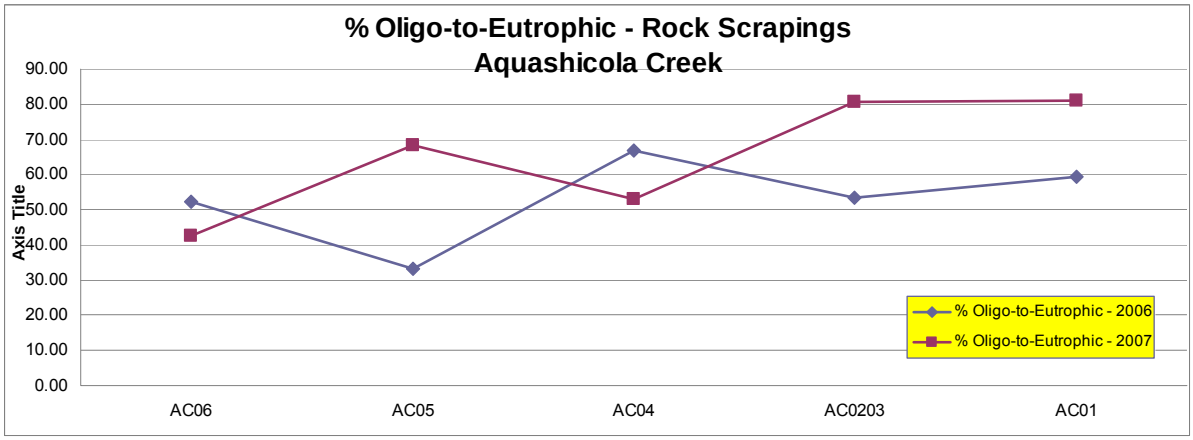
The high water levels of 2006 caused a scouring action that will change the taxa population based on the stream bed components. Those with more sand and gravel will be more scoured and thus have fewer organisms than those with a more stable stream bed. In 2007 the flow was more constant, allowing for a more constant taxa level.



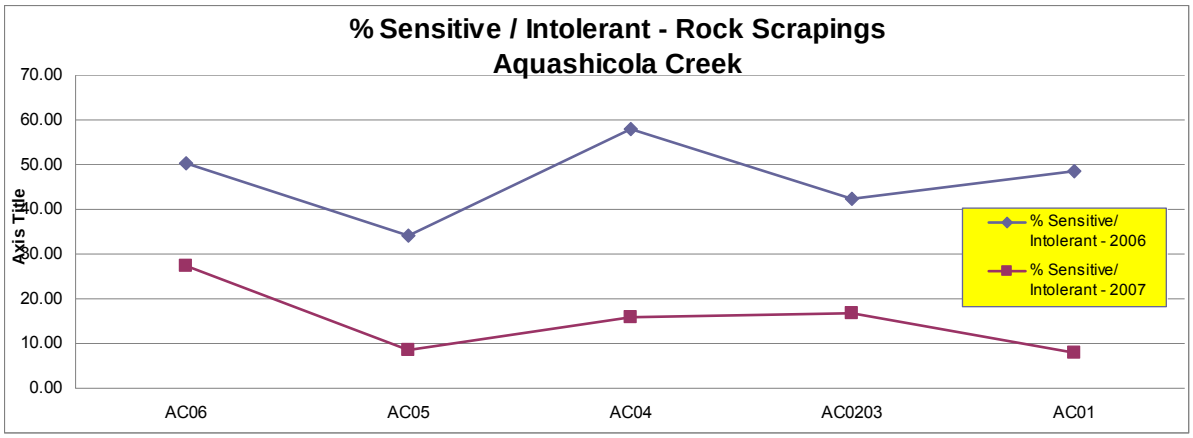
There was an increase in the group that represents moderately polluted water from 2006 to 2007. The lesser flow will concentrate the polluting factors and allow it to be more constant.



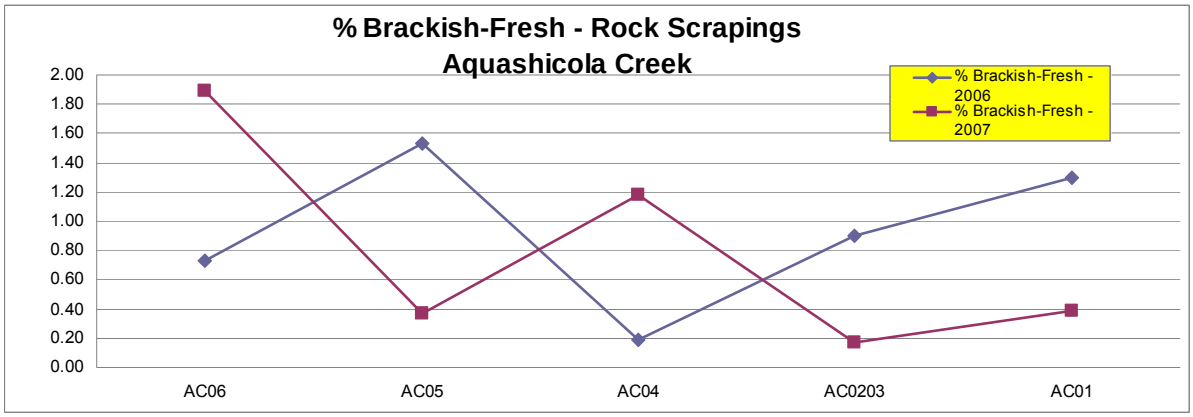
The area above AC06 is a bog like area that will add a higher organic load. The high water levels of 2006 cause a scouring action that will change the taxa population based on the stream bed components. Those with more sand and gravel will be more scoured and thus have fewer organisms than those with a more stable stream bed.

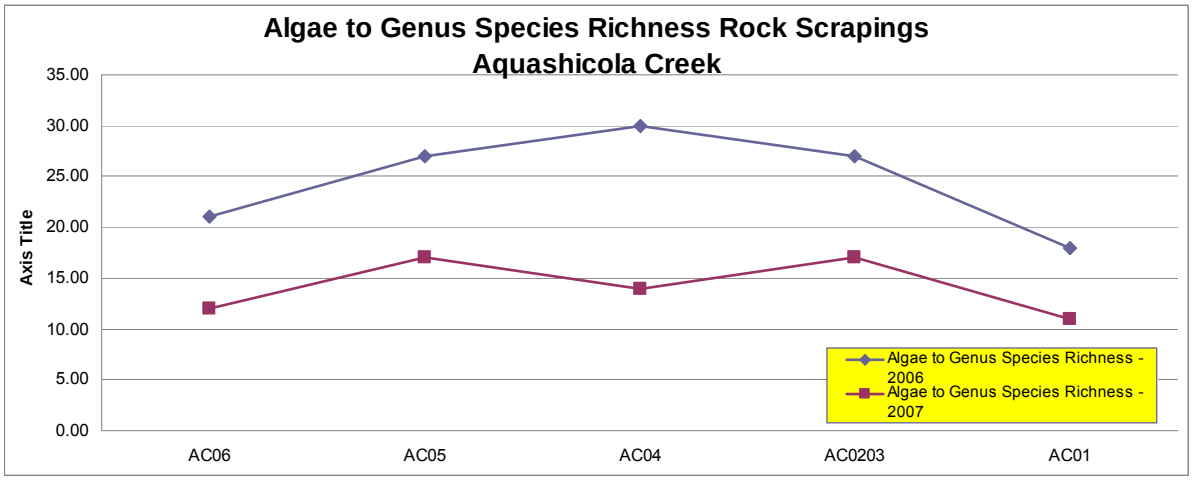


In 2007 the trend for the ratio of oligotrophic to eutrophic was less than 2006.



There were more taxa in the sensitive/intolerant group in 2006 compared to 2007. The lack of flow concentrates the pollution thus eliminating those that are intolerant.



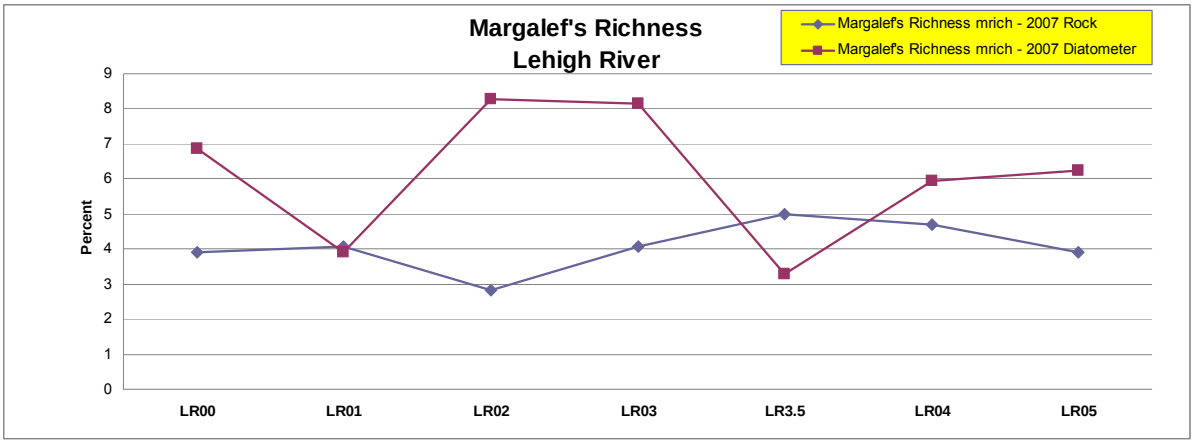


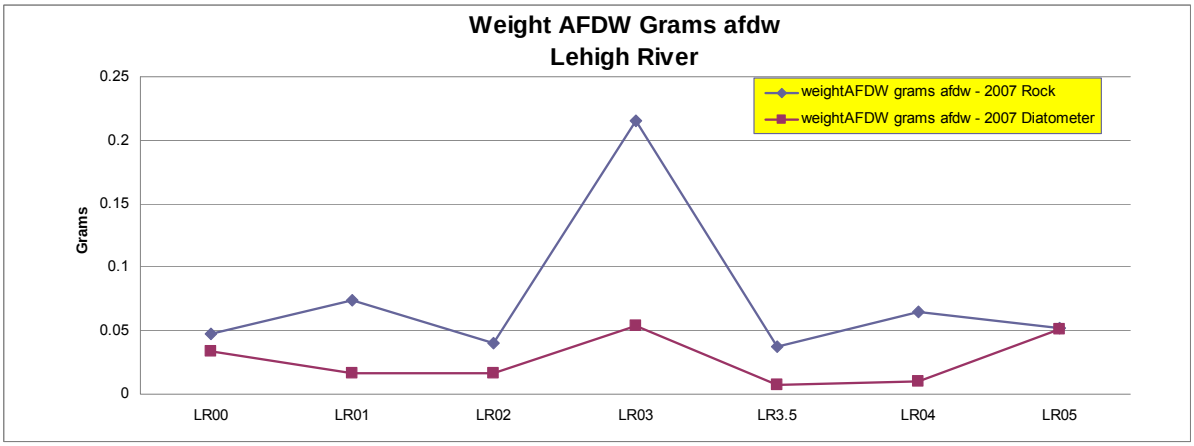
When physical conditions change to the extreme biological changes occur. In 2006 there was great flow which would tend to dilute any pollutants and nutrients and maintain the temperature at a lower level; however, in 2007 the flow conditions were low and slow and in some places almost stagnant. These conditions cause a concentration of these factors and a large increase in temperature.

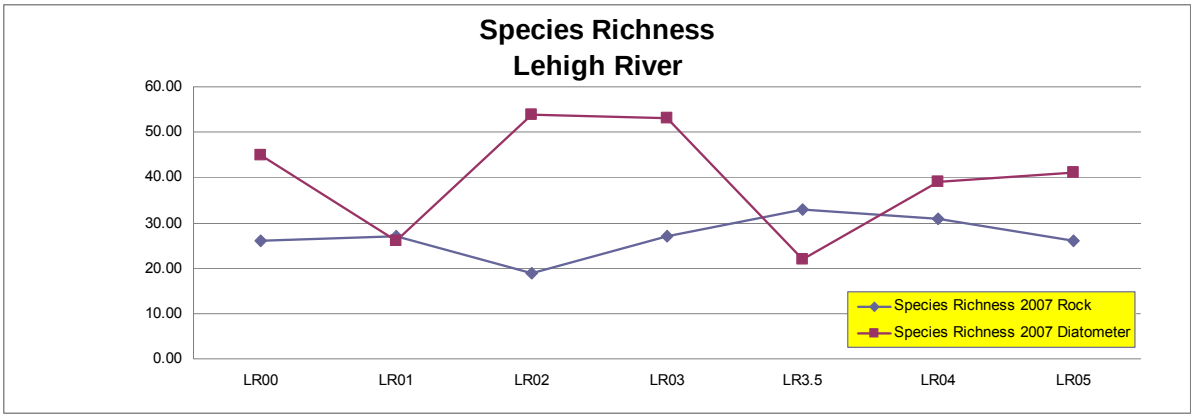
The Lehigh River demonstrates a change at LR03 which is just below the confluence with Aquashicola Creek. The nutrient loads and other materials would account for the changes in this area. These changes, however, do not appear to be long lasting downstream of the confluence. All the graphs show the impact of the addition of Aquashicola Creek and the

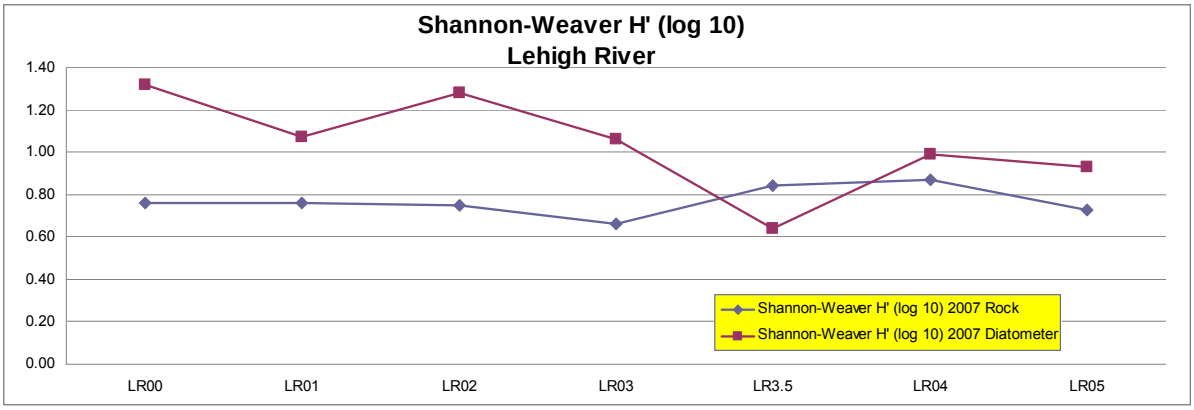
dilution of these factors. This occurred at low flow and one would surmise that the impact would be less and dilute more quickly at a higher flow.

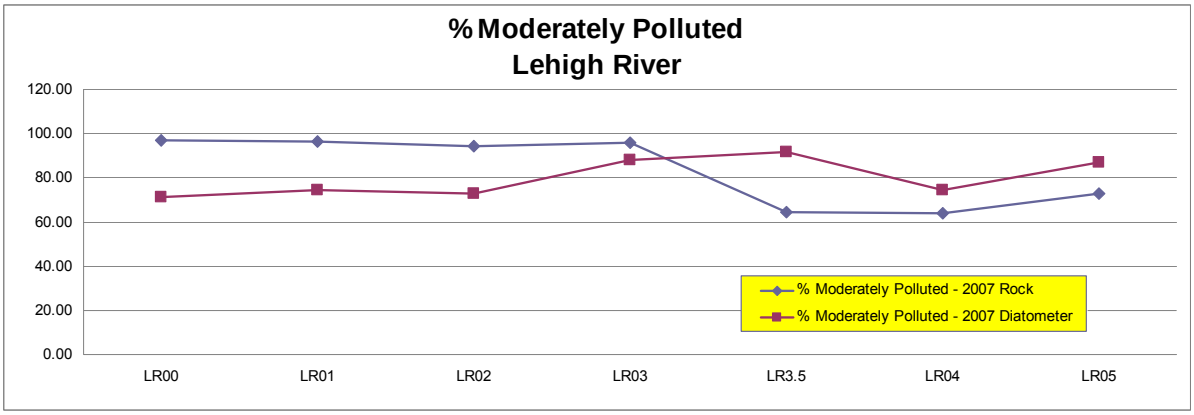
The periphytometers demonstrate there are several taxa available for colonization but because of the heavy load of drying biofilm they are not viable on the rock surfaces. The low flow and higher water temperature also restricts the growth of some taxa. Siltation increases the unsuitable conditions for growth on the rocks. The periphytometers do not have the silt load and dry biofilm so there is more available surface for these taxa. This would explain the difference in richness of taxa and different taxa on the rocks compared to the periphytometers.

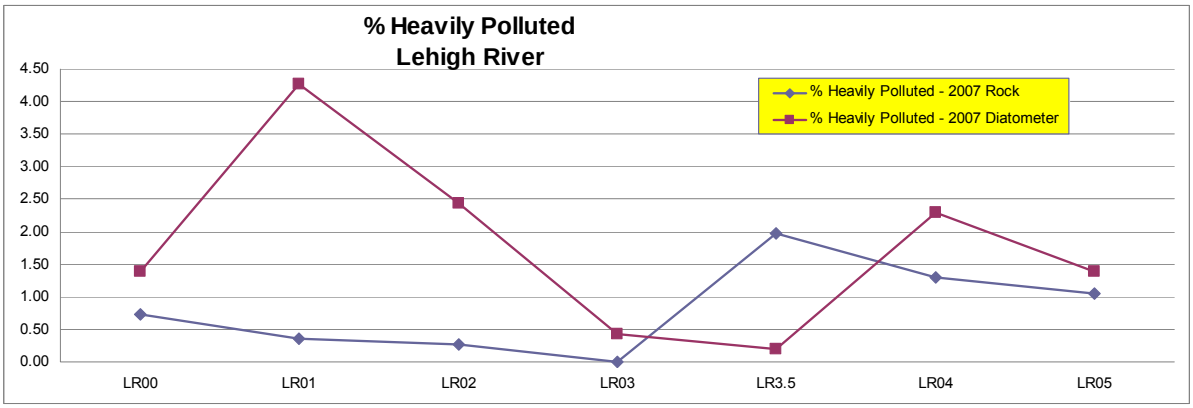


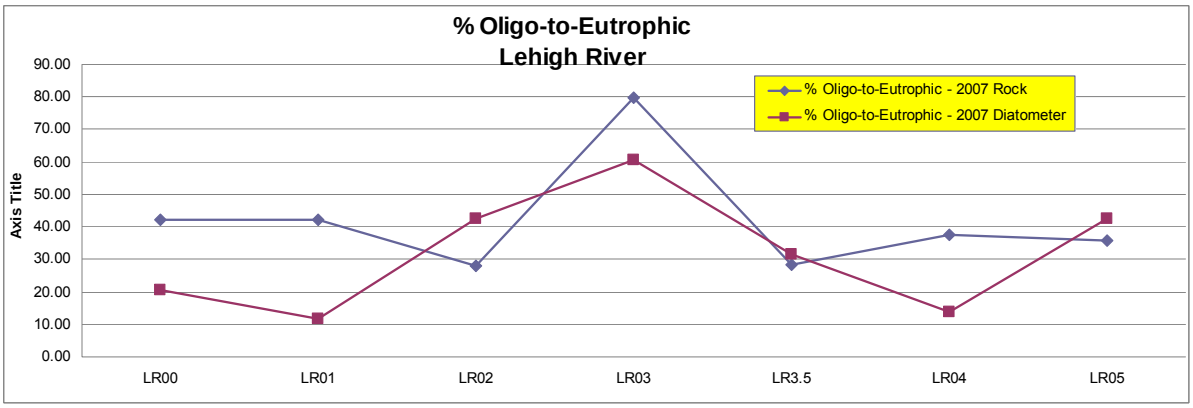


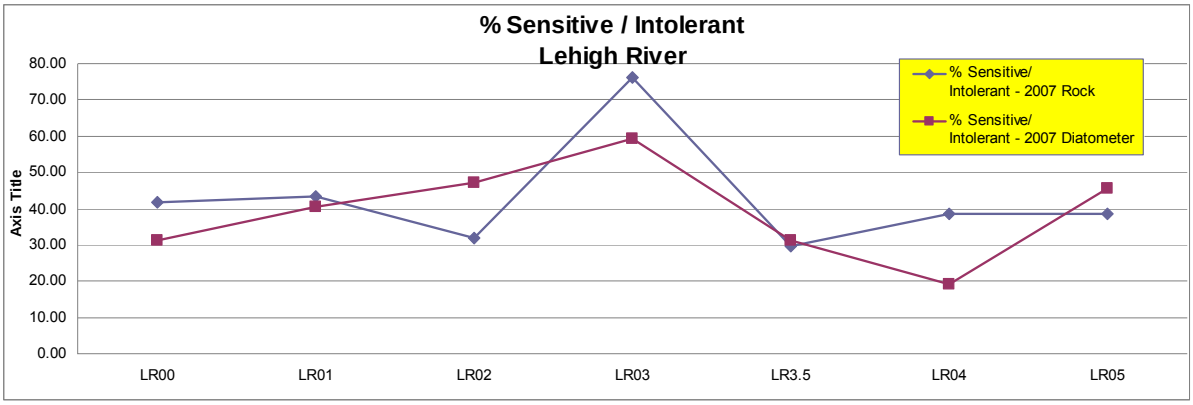


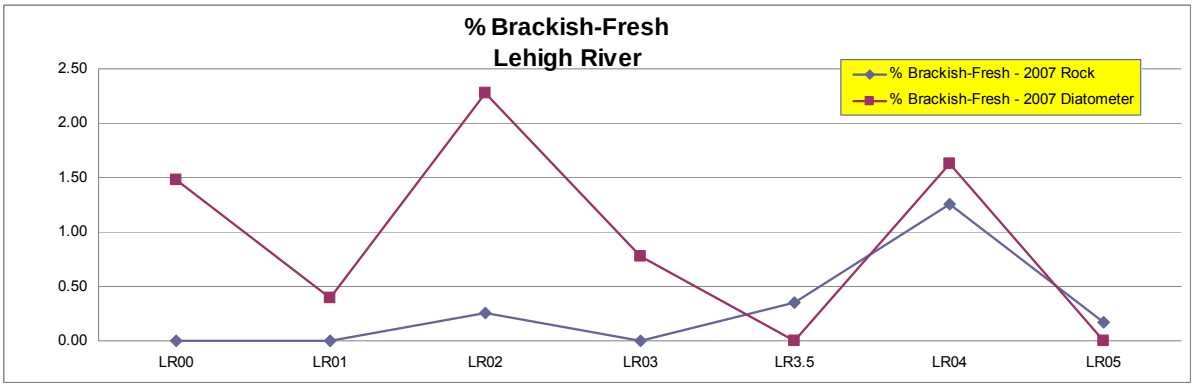

Shannon-Weaver H' (log 10)
Lehigh River
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
LR00
LR01
LR02
LR03
LR3.5
LR04
LR05
Shannon-Weaver H' (log 10) 2007 Rock
Shannon-Weaver H' (log 10) 2007 Diatometer

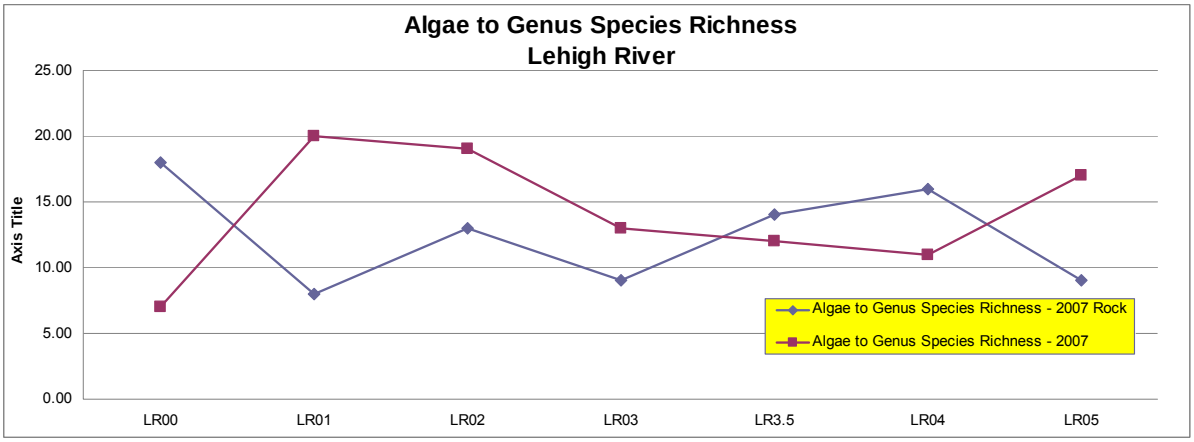

% Moderately Polluted
Lehigh River
120.00
100.00
80.00
60.00
40.00
20.00
0.00
LR00
LR01
LR02
LR03
LR3.5
LR04
LR05
% Moderately Polluted - 2007 Rock
% Moderately Polluted - 2007 Diatometer


% Heavily Polluted
Lehigh River
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
LR00
LR01
LR02
LR03
LR3.5
LR04
LR05
% Heavily Polluted - 2007 Rock
% Heavily Polluted - 2007 Diatometer


% Oligo-to-Eutrophic
Lehigh River
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Axis Title
LR00
LR01
LR02
LR03
LR3.5
LR04
LR05
% Oligo-to-Eutrophic - 2007 Rock
% Oligo-to-Eutrophic - 2007 Diatometer







APPENDIX 2. 2006-2007 Algae Taxa and Metrics

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Taxa
Diatom Identifications

	Site ID	MC01	BC09	BC10	BC10	BC09	BC10
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
	Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
Achnanthes	*Achnanthes biporoma*	0	0	0	0	*0*	*0*
	Achnanthes clevei	*0*	*0*	*0*	*0*	0	0
	Achnanthes conspicua	0	4	0	0	0	0
	Achnanthes daonensis	*0*	*0*	*0*	*0*	0	0
	Achnanthes deflexa	3	5	4	2	54	8
	Achnanthes detha	*0*	*0*	*0*	*0*	0	0
	Achnanthes exigua	0	0	0	0	*0*	*0*
	Achnanthes flexella	0	0	0	0	*0*	*0*
	Achnanthes hauckiana	0	0	0	0	0	1
	Achnanthes hauckiana var. *rostrata*	0	0	0	0	0	0
	Achnanthes hungarica	*0*	*0*	*0*	*0*	0	0
	Achnanthes laevis	0	0	0	0	0	0
	Achnanthes lanceolata	0	0	0	0	0	0
	Achnanthes lanceolata var. *apiculata*	0	0	0	0	*0*	*0*
	Achnanthes lanceolata var. *dubia*	0	0	0	1	8	2
	Achnanthes linearis	7	10	0	5	214	8
	Achnanthes microcephala	*0*	*0*	*0*	*0*	0	0
	Achnanthes minutissima	196	364	244	303	10	196
	Achnanthes peragalli	*0*	*0*	*0*	*0*	0	0
	Achnanthes sp.	*0*	*0*	*0*	*0*	18	0
	Achnanthes stewartii	*0*	*0*	*0*	*0*	0	0
	Achnanthes subhudsonis	*0*	*0*	*0*	*0*	0	2
Amphora	*Amphora ovalis*	0	0	0	0	*0*	*0*
	Amphora pediculus	0	0	0	2	0	0
	Amphora perpusilla	*0*	*0*	*0*	*0*	2	0
	Amphora submontana	*0*	*0*	*0*	*0*	0	0
Anomoeoneis	*Anomoeoneis brachysira*	*0*	*0*	*0*	*0*	0	0
	Anomoeoneis vitrea	*0*	*0*	*0*	*0*	0	0
Aulacoseira	*Aulacoseira granulata*	*0*	*0*	*0*	*0*	0	0
	Aulacoseira granulata var. *angustissima*	*0*	*0*	*0*	*0*	0	2
Brachysira	*Brachysira neoexilis*	*0*	*0*	*0*	*0*	0	0
Caloneis	*Caloneis bacillum*	*0*	*0*	*0*	*0*	0	0
Cocconeis	*Cocconeis neodiminuta*	*0*	*0*	*0*	*0*	0	0
	Cocconeis neothumensis	*0*	*0*	*0*	*0*	0	0
	Cocconeis pediculus	0	0	2	5	0	0
	Cocconeis placentula	*0*	*0*	*0*	*0*	0	2
	Cocconeis placentula var. *euglypta*	*0*	*0*	*0*	*0*	30	8
	Cocconeis placentula var. *intermedia*	*0*	*0*	*0*	*0*	0	0
	Cocconeis placentula var. *lineata*	18	5	11	5	4	12
	Cocconeis sp.	*0*	*0*	*0*	*0*	0	0
Cyclotella	*Cyclotella distinguenda*	0	0	0	0	*0*	*0*
	Cyclotella meneghiniana	1	0	1	0	8	8
	Cyclotella sp.	*0*	*0*	*0*	*0*	0	0
	Cyclotella stelligera	0	0	0	3	0	0
Cymatopleura	*Cymatopleura solea*	0	0	0	0	*0*	*0*
Cymbella	*Cymbella affinis*	0	0	0	0	2	4
	Cymbella aspera	0	1	0	0	0	0
	Cymbella cistula	0	0	0	0	*0*	*0*

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Taxa
Diatom Identifications

	Site ID	MC01	BC09	BC10	BC10	BC09	BC10
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
	Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
	Cymbella cymbiformis	0	1	0	2	*0*	*0*
	Cymbella excisa	0	0	0	0	*0*	*0*
	Cymbella gracilis	*0*	*0*	*0*	*0*	0	0
	Cymbella lanceolata	0	0	0	0	*0*	*0*
	Cymbella lunata	0	0	0	0	0	0
	Cymbella mexicana	0	0	0	0	*0*	*0*
	Cymbella microcephala	0	0	1	0	*0*	*0*
	Cymbella minuta	12	3	5	9	20	24
	Cymbella minuta var. *latens*	0	0	0	0	*0*	*0*
	Cymbella minuta var. *silesiaca*	0	0	3	1	0	0
	Cymbella muelleri	0	0	0	0	*0*	*0*
	Cymbella sp.	*0*	*0*	*0*	*0*	2	0
	Cymbella subhelvetica	*0*	*0*	*0*	*0*	0	0
	Cymbella subturgidula	0	0	0	0	0	0
	Cymbella triangulum	0	0	0	0	2	0
	Cymbella tumida	0	1	6	2	0	11
Diatoma	*Diatoma anceps*	0	0	0	0	*0*	*0*
	Diatoma anceps var. *linearis*	0	0	0	0	*0*	*0*
	Diatoma hiemalis	*0*	*0*	*0*	*0*	0	0
	Diatoma mesdon	*0*	*0*	*0*	*0*	0	0
	Diatoma moniliformis	0	0	0	0	*0*	*0*
	Diatoma tenue var. *elongatum*	0	0	0	0	*0*	*0*
	Diatoma sp.	*0*	*0*	*0*	*0*	0	0
	Diatoma vulgaris	0	0	0	0	0	0
	Diatoma vulgaris var. *brevis*	*0*	*0*	*0*	*0*	0	0
Diploneis	*Diploneis elliptica*	*0*	*0*	*0*	*0*	0	0
Epithemia	*Epithemia turgida*	*0*	*0*	*0*	*0*	0	0
Eunotia	*Eunotia arcus*	*0*	*0*	*0*	*0*	0	0
	Eunotia curvata	*0*	*0*	*0*	*0*	0	0
	Eunotia incisa	*0*	*0*	*0*	*0*	0	0
	Eunotia maior	0	0	0	0	*0*	*0*
	Eunotia pectinalis	*0*	*0*	*0*	*0*	0	0
	Eunotia pectinalis var. *minor*	0	1	0	0	0	0
	Eunotia praerupta	*0*	*0*	*0*	*0*	0	0
	Eunotia serra var. *diadema*	0	0	1	0	*0*	*0*
	Eunotia vanheurckii	0	0	1	0	*0*	*0*
	Eunotia vanheurckii var. *intermedia*	0	0	0	0	*0*	*0*
Fragilaria	*Fragilaria brevistriata* var. *inflata*	*0*	*0*	*0*	*0*	2	4
	Fragilaria capucina	0	0	0	0	30	17
	Fragilaria capucina var. *mesolepta*	5	0	0	0	0	0
	Fragilaria construens	0	0	0	0	0	0
	Fragilaria construens var. *venter*	0	0	0	1	0	2
	Fragilaria crotonensis	0	0	4	0	0	0
	Fragilaria leptostauron	0	0	7	0	0	0
	Fragilaria leptostauron var. *dubia*	*0*	*0*	*0*	*0*	0	0
	Fragilaria pinnata	*0*	*0*	*0*	*0*	0	0
	Fragilaria sp.	*0*	*0*	*0*	*0*	30	0
	Fragilaria vaucheriae	8	1	6	6	20	11
	Fragilaria vaucheriae var. *capitellata*	0	2	3	0	0	26

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Taxa

Diatom Identifications

	Site ID	MC01	BC09	BC10	BC10	BC09	BC10
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
	Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
	Fragilaria virescens	0	0	0	2	*0*	*0*
	Fragilaria virescens var. *capitata*	0	0	0	1	0	0
Frustulia	*Frustulia rhomboides*	0	4	3	1	0	0
	Frustulia rhomboides var. *capitata*	0	0	0	0	*0*	*0*
	Frustulia vulgaris	0	0	1	0	0	0
	Frustulia vulgaris var. *capitata*	0	0	0	1	*0*	*0*
Gomphonema	*Gomphonema abbreviatum*	*0*	*0*	*0*	*0*	2	0
	Gomphonema acuminatum	0	0	0	0	*0*	*0*
	Gomphonema affine	0	0	0	0	*0*	*0*
	Gomphonema augur var. *turris*	*0*	*0*	*0*	*0*	0	0
	Gomphonema gracile	*0*	*0*	*0*	*0*	0	2
	Gomphonema intricatum	0	0	0	2	*0*	*0*
	Gomphonema minutum	*0*	*0*	*0*	*0*	0	0
	Gomphonema parvulum	20	3	7	8	14	26
	Gomphonema parvulum var. *saprophilum*	*0*	*0*	*0*	*0*	0	2
	Gomphonema sp.	*0*	*0*	*0*	*0*	0	4
	Gomphonema sphaerophorum	0	1	1	3	2	4
	Gomphonema subclavatum var. *mexicanum*	0	0	0	0	0	0
Gyrosigma	*Gyrosigma acuminatum*	0	0	0	0	*0*	*0*
Hannaea	*Hannaea arcus*	*0*	*0*	*0*	*0*	0	0
Hantzschia	*Hantzschia amphioxys*	0	0	0	0	0	0
Melosira	*Melosira ambigua*	*0*	*0*	*0*	*0*	0	0
	Melosira varians	74	155	215	138	20	18
Meridion	*Meridion circulare*	0	2	1	0	8	0
	Meridion circulare var. *constrictum*	0	3	3	0	0	0
Navicula	*Navicula amphiceropsis*	0	0	0	0	*0*	*0*
	Navicula angusta	0	0	0	0	0	0
	Navicula arvensis	1	0	0	0	0	0
	Navicula atomus	0	0	0	0	0	0
	Navicula bacillum	0	0	0	0	*0*	*0*
	Navicula capitata	0	0	0	0	0	0
	Navicula cincta	*0*	*0*	*0*	*0*	0	0
	Navicula cocconeiformis	0	0	0	0	*0*	*0*
	Navicula contenta	0	0	0	0	*0*	*0*
	Navicula cryptocephala	2	2	4	2	14	22
	Navicula cuspidata	0	0	0	0	*0*	*0*
	Navicula decussis	0	0	0	0	0	0
	Navicula gregaria	1	0	1	1	4	0
	Navicula halophila	*0*	*0*	*0*	*0*	0	0
	Navicula laevissima	*0*	*0*	*0*	*0*	0	0
	Navicula meniculus var. *obtusa*	0	0	0	0	*0*	*0*
	Navicula menisculus	0	1	0	0	0	0
	Navicula menisculus var. *upsaliensis*	0	0	0	0	0	0
	Navicula mutica	0	0	0	0	0	0
	Navicula notha	*0*	*0*	*0*	*0*	0	1
	Navicula pelliculosa	*0*	*0*	*0*	*0*	0	0
	Navicula peregrina	*0*	*0*	*0*	*0*	0	0
	Navicula phyllepta	*0*	*0*	*0*	*0*	0	4

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Taxa

Diatom Identifications

	Site ID	MC01	BC09	BC10	BC10	BC09	BC10
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
	Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
	Navicula phylleptosoma	0	0	0	0	*0*	*0*
	Navicula protracta	0	0	0	0	*0*	*0*
	Navicula pseudoscutiformis	0	0	0	0	*0*	*0*
	Navicula pupula	0	0	0	0	0	0
	Navicula radiosa	0	0	0	0	*0*	*0*
	Navicula radiosa var. *parva*	0	0	0	0	0	4
	Navicula radiosa var. *tenella*	0	5	4	5	32	31
	Navicula rhynchocephala	0	0	0	0	0	1
	Navicula rhynchocephala var. *germainii*	1	0	0	0	0	0
	Navicula sp.	*0*	*0*	*0*	*0*	0	0
	Navicula subminuscula	*0*	*0*	*0*	*0*	0	0
	Navicula submolesta	*0*	*0*	*0*	*0*	0	0
	Navicula symmetrica	*0*	*0*	*0*	*0*	0	0
	Navicula tripunctata	2	1	0	0	*0*	*0*
	Navicula trivialis	0	0	1	0	0	0
	Navicula veneta	0	0	2	1	0	2
	Navicula vilaplanii	0	0	0	0	0	0
	Navicula viridula	0	0	0	1	*0*	*0*
	Navicula viridula var. *avenacea*	0	0	0	1	0	1
	Navicula viridula var. *linearis*	0	0	0	0	0	0
	Navicula viridula var. *rostellata*	1	0	0	0	0	2
Neidium	*Neidium hercynicum*	*0*	*0*	*0*	*0*	0	0
	Neidium sp.	*0*	*0*	*0*	*0*	0	0
Nitzschia	*Nitzschia abridia*	*0*	*0*	*0*	*0*	0	0
	Nitzschia acicularis	*0*	*0*	*0*	*0*	0	4
	Nitzschia amphibia	3	0	0	1	0	0
	Nitzschia amphibioides	*0*	*0*	*0*	*0*	0	0
	Nitzschia angustata	0	0	0	0	0	0
	Nitzschia capitellata	0	0	0	1	0	7
	Nitzschia clausii	0	0	0	0	*0*	*0*
	Nitzschia communis	1	0	0	2	0	0
	Nitzschia dissipata	0	1	2	2	4	0
	Nitzschia filiformis	0	1	0	0	0	3
	Nitzschia fonticola	0	0	0	0	0	0
	Nitzschia frustulum	*0*	*0*	*0*	*0*	2	10
	Nitzschia frustulum var. *perminuta*	0	0	0	0	0	0
	Nitzschia graciliformis	*0*	*0*	*0*	*0*	0	0
	Nitzschia gracilis	0	0	1	1	0	8
	Nitzschia heufleriana	0	0	0	0	0	0
	Nitzschia inconspicua	*0*	*0*	*0*	*0*	2	0
	Nitzschia intermedia	0	0	0	0	0	0
	Nitzschia lancettula	0	0	0	0	0	0
	Nitzschia linearis	1	0	1	0	0	2
	Nitzschia microcephala	*0*	*0*	*0*	*0*	0	2
	Nitzschia palea	1	2	0	1	6	17
	Nitzschia palea var. *debilis*	*0*	*0*	*0*	*0*	26	2
	Nitzschia pura	*0*	*0*	*0*	*0*	0	0
	Nitzschia pusilla	0	0	0	0	0	1
	Nitzschia rosenstockii	*0*	*0*	*0*	*0*	0	0

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Taxa
Diatom Identifications

	Site ID	MC01	BC09	BC10	BC10	BC09	BC10
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
	Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
	Nitzschia sigma	0	0	0	0	*0*	*0*
	Nitzschia sinuata	0	0	0	0	*0*	*0*
	Nitzschia sociabilis	0	0	0	0	*0*	*0*
	Nitzschia sp.	*0*	*0*	*0*	*0*	0	11
	Nitzschia subinflata	0	0	0	0	*0*	*0*
	Nitzschia umbonata	0	0	0	0	*0*	*0*
Pinnularia	*Pinnularia abaujensis* var. *linearis*	*0*	*0*	*0*	*0*	0	0
	Pinnularia biceps var. *pusilla*	*0*	*0*	*0*	*0*	0	0
	Pinnularia mesolepta	*0*	*0*	*0*	*0*	0	0
	Pinnularia microstauron	1	0	0	0	*0*	*0*
	Pinnularia sp.	*0*	*0*	*0*	*0*	0	0
	Pinnularia subcapitata	1	0	0	0	0	0
Planothidium	*Planothidium frequentissimum*	30	0	8	9	0	27
Reimeria	*Reimeria sinuata*	4	2	2	1	0	5
Rhoicosphenia	*Rhoicosphenia curvata*	123	6	9	49	0	4
Stauroneis	*Stauroneis anceps* f. *linearis*	0	0	1	0	*0*	*0*
	Stauroneis smithii	0	0	0	0	*0*	*0*
	Stauroneis tackei	1	0	1	0	0	0
Stenopterobia	*Stenopterobia delicatissima*	*0*	*0*	*0*	*0*	0	0
Surirella	*Surirella angusta*	0	1	0	1	0	0
	Surirella brebissonii	0	0	0	0	0	0
	Surirella linearis var. *helvetica*	0	0	0	0	*0*	*0*
	Surirella ovalis	0	0	0	0	0	0
	Surirella ovata	*0*	*0*	*0*	*0*	0	0
	Surirella ovata var. *crumena*	0	0	0	0	*0*	*0*
	Surirella ovata var. *pinnata*	*0*	*0*	*0*	*0*	0	0
	Surirella tenera	0	0	0	1	0	0
Synedra	*Synedra acus*	*0*	*0*	*0*	*0*	0	0
	Synedra incisa	*0*	*0*	*0*	*0*	0	0
	Synedra parasitica	0	0	1	0	0	0
	Synedra pulchella	*0*	*0*	*0*	*0*	6	0
	Synedra rumpens	0	0	19	12	0	2
	Synedra rumpens var. *familiaris*	34	4	0	0	0	0
	Synedra rumpens var. *fragilarioides*	*0*	*0*	*0*	*0*	0	0
	Synedra rumpens var. *meneghiniana*	*0*	*0*	*0*	*0*	0	0
	Synedra sp.	*0*	*0*	*0*	*0*	0	14
	Synedra tenera	1	0	0	0	0	5
	Synedra ulna	32	8	9	4	0	4
	Synedra ulna var. *chaseana*	0	0	0	0	*0*	*0*
	Synedra ulna var. *contracta*	15	0	4	1	2	0
Tabellaria	*Tabellaria fenestrata*	*0*	*0*	*0*	*0*	0	0
	Tabellaria flocculosa	0	0	0	0	0	0
	TOTAL	**600**	**600**	**600**	**600**	**600**	**600**

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Metrics

Diatom Metrics

Site	MC01	BC09	BC10	BC10	BC09	BC10
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
Abundance Measures						
Species Richness	30.00	30.00	39.00	42.00	32.00	52.00
Number of Valves Counted	600.00	600.00	600.00	600.00	600.00	600.00
Total Cells Counted	300.00	300.00	300.00	300.00	300.00	300.00
Dominance Measures						
Dominant Taxon	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes linearis*	*Achnanthes minutissima*
Dominant Taxon Abundance	196.00	364.00	244.00	303.00	214.00	196.00
2nd Dominant Taxon	*Rhoicosphenia curvata*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Achnanthes deflexa*	*Navicula radiosa* var. *tenella*
2nd Dominant Taxon Abundance	123.00	155.00	215.00	138.00	54.00	31.00
3rd Dominant Taxon	*Melosira varians*	*Achnanthes linearis*	*Synedra rumpens*	*Rhoicosphenia curvata*	*Navicula radiosa* var. *tenella*	*Planothidium frequentissimum*
3rd Dominant Taxon Abundance	74.00	10.00	19.00	49.00	32.00	27.00
4th Dominant Taxon	*Synedra rumpens* var. *familiaris*	*Synedra ulna*	*Cocconeis placentula* var. *lineata*	*Synedra rumpens*	*Cocconeis placentula* var. *euglypta*	*Fragilaria vaucheriae* var. *capitellata*
4th Dominant Taxon Abundance	34.00	8.00	11.00	12.00	30.00	26.00
5th Dominant Taxon	*Synedra ulna*	*Rhoicosphenia curvata*	*Rhoicosphenia curvata*	*Cymbella minuta*	*Fragilaria capucina*	*Gomphonema parvulum*
5th Dominant Taxon Abundance	32.00	6.00	9.00	9.00	30.00	26.00
% Dominant Taxon	32.67	60.67	40.67	50.50	35.67	32.67
% 2nd Dominant Taxon	20.50	25.83	35.83	23.00	9.00	5.17
% 3rd Dominant Taxon	12.33	1.67	3.17	8.17	5.33	4.50
% 4th Dominant Taxon	5.67	1.33	1.83	2.00	5.00	4.33
% 5th Dominant Taxon	5.33	1.00	1.50	1.50	5.00	4.33
Diversity/Evenness Measures						
Shannon-Weaver H' (log e)	2.21	1.34	1.83	1.80	2.57	2.99
Shannon-Weaver H' (log 10)	0.96	0.58	0.80	0.78	1.12	1.30
Shannon-Weaver H' (log 2)	3.19	1.93	2.65	2.60	3.71	4.31
Margalef's Richness	4.53	4.53	5.94	6.41	4.85	7.97
Van Dam Indices						
Van Dam pH	3.31	3.30	3.49	3.33	3.30	3.23
Van Dam Salinity	2.00	1.99	2.00	2.01	1.96	2.05
Van Dam Nitrogen Uptake	2.31	2.28	2.39	2.30	2.42	2.25
Van Dam Oxygen Tolerance	1.84	1.64	1.98	1.70	2.98	1.93
Van Dam Saprobity	2.38	2.29	2.43	2.33	2.39	2.38
Van Dam Trophic State	6.14	6.28	5.84	6.17	4.17	5.83
Van Dam Moisture	2.71	2.67	2.48	2.64	2.39	2.62
pH Preference						
% at Optimal Occurance pH 5.5	0.00	0.00	0.00	0.00	0.00	0.00
% Mainly Occuring at pH<7	0.56	0.88	0.76	0.20	0.00	1.35
% Mainly Occuring at pH~7	68.26	68.60	49.91	66.47	70.17	74.49
% Mainly Occuring at pH>7	31.18	30.53	49.34	33.33	29.83	23.93

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Metrics

Diatom Metrics

Site	MC01	BC09	BC10	BC10	BC09	BC10
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
% Exclusively Occuring at pH>7	0.00	0.00	0.00	0.00	0.00	0.23
% at no Apparent Optimum	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified pH	40.67	5.00	11.83	16.00	20.67	26.17
Richness at pH <5.5	0.00	0.00	0.00	0.00	0.00	0.00
Richness at pH <7	2.00	2.00	2.00	1.00	0.00	2.00
Richness at pH ~7	8.00	9.00	7.00	11.00	8.00	13.00
Richness at pH >7	12.00	11.00	17.00	17.00	13.00	20.00
Richness Exclusively at pH >7	0.00	0.00	0.00	0.00	0.00	1.00
Richness at no Optimum	0.00	0.00	0.00	0.00	0.00	0.00
Salinity Preference						
% Fresh	0.29	1.61	0.94	1.00	9.92	3.64
% Fresh-Brackish	99.14	98.21	97.74	97.41	83.97	89.98
% Brackish-Fresh	0.57	0.00	1.32	1.39	6.11	4.56
% Brackish	0.00	0.18	0.00	0.20	0.00	1.82
% Marine	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Salinity	41.67	6.67	11.67	16.33	56.33	26.83
Richness Fresh	1.00	3.00	3.00	4.00	1.00	4.00
Richness Fresh-Brackish	19.00	17.00	19.00	21.00	15.00	26.00
Richness Brackish-Fresh	2.00	0.00	5.00	3.00	4.00	3.00
Richness Brackish	0.00	1.00	0.00	1.00	0.00	3.00
Richness Marine	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Uptake Metabolism						
% Very Small Tolerance N	0.30	2.00	3.66	1.86	3.03	7.26
% Elevated Tolerance N	69.30	68.78	53.37	67.15	57.58	69.09
% Needing Periodically Elevated N	29.79	28.86	42.97	30.37	33.33	14.78
% Needing Continuously Elevated N	0.61	0.36	0.00	0.62	6.06	8.87
% Unclassified Nitrogen	45.17	8.17	13.50	19.33	78.00	38.00
Richness at Small Tolerance N	1.00	5.00	6.00	5.00	2.00	6.00
Richness at Elevated Tolerance N	11.00	9.00	14.00	12.00	8.00	13.00
Richness at Periodic Elevated N	4.00	3.00	3.00	3.00	4.00	4.00
Richness at Continuously Elevated N	2.00	1.00	0.00	2.00	2.00	4.00
Oxygen Requirements						
% at Continuously High Oxygen	61.09	67.70	51.15	64.61	10.61	60.53
% at Fairly High Oxygen	1.52	1.63	2.31	2.67	10.61	3.42
% at Moderate Oxygen	30.40	29.76	44.42	30.45	54.55	20.79
% at Low Oxygen	6.69	0.91	1.92	2.26	18.18	13.16
% at Very Low Oxygen	0.30	0.00	0.19	0.00	6.06	2.11
% Unclassified Oxygen	45.17	8.17	13.33	19.00	78.00	36.67
Richness at High Oxygen	3.00	6.00	9.00	8.00	3.00	9.00
Richness at Fairly High Oxygen	4.00	5.00	7.00	7.00	3.00	4.00
Richness at Moderate Oxygen	7.00	5.00	4.00	5.00	6.00	9.00
Richness at Low Oxygen	3.00	2.00	3.00	4.00	3.00	5.00
Richness at Very Low Oxygen	1.00	0.00	1.00	0.00	1.00	1.00
Saprobity						
% Very Slightly Polluted	0.30	2.17	3.46	1.85	14.89	6.23
% Moderately Polluted	68.39	68.12	52.12	66.26	48.94	67.83

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Metrics

Diatom Metrics

Site	MC01	BC09	BC10	BC10	BC09	BC10
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
% Moderate-Heavily Polluted	24.32	28.80	42.50	29.42	21.28	12.22
% Heavily Polluted	6.69	0.54	1.92	2.26	11.70	8.98
% Very Heavily Polluted	0.30	0.36	0.00	0.21	3.19	4.74
% Unclassified Saprobity	45.17	8.00	13.33	19.00	68.67	33.17
Richness Very Slightly Polluted	1.00	6.00	5.00	5.00	2.00	6.00
Richness Moderately Polluted	9.00	7.00	12.00	10.00	9.00	15.00
Richness Moderate-Heavily Polluted	4.00	4.00	4.00	5.00	4.00	5.00
Richness Heavily Polluted	3.00	1.00	3.00	3.00	2.00	3.00
Richness Very Heavily Polluted	1.00	1.00	0.00	1.00	1.00	2.00
Trophic State						
% Oligotrophic	0.00	0.72	0.76	0.61	10.74	0.73
% Oligo-Mesotrophic	0.60	0.18	0.00	0.82	0.00	1.46
% Mesotrophic	2.11	1.26	2.10	0.82	34.71	9.73
% Meso-Eutrophic	0.30	0.36	3.82	1.02	1.65	3.65
% Eutrophic	36.75	30.04	45.80	34.15	36.36	25.30
% Hypereutrophic	0.30	0.36	0.00	0.20	2.48	4.62
% Oligo-to-Eutrophic	59.94	67.09	47.52	62.37	14.05	54.50
% Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Trophic	44.67	7.33	12.67	18.50	59.67	31.50
Richness Oligotrophic	0.00	1.00	2.00	2.00	1.00	2.00
Richness Oligo-Mesotrophic	2.00	1.00	0.00	2.00	0.00	2.00
Richness Mesotrophic	2.00	2.00	4.00	3.00	2.00	5.00
Richness Meso-Eutrophic	1.00	2.00	8.00	3.00	1.00	3.00
Richness Eutrophic	10.00	7.00	8.00	13.00	10.00	15.00
Richness Hypereutrophic	1.00	1.00	0.00	1.00	1.00	2.00
Richness Oligo-to-Eutrophic	3.00	5.00	3.00	2.00	4.00	5.00
Richness Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00
Moisture						
% Never Outside Water	0.00	1.27	2.69	2.87	5.06	7.59
% Mainly in Water, Sometimes Wet	29.79	30.49	46.73	30.33	50.63	22.51
% Mainly in Water, Regularly Wet	69.91	68.06	50.58	66.39	44.30	69.90
% Mainly Wet, Moist or Temporarily Dry	0.30	0.18	0.00	0.41	0.00	0.00
% Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Moisture	45.17	8.17	13.33	18.67	73.67	36.33
Richness Never Outside Water	0.00	3.00	5.00	7.00	1.00	6.00
Richness Mainly in Water, Sometimes Wet	7.00	6.00	8.00	5.00	7.00	11.00
Richness Mainly in Water, Regularly Wet	10.00	8.00	11.00	12.00	9.00	12.00
Richness Mainly Wet, Moist or Temporarily Dry	1.00	1.00	0.00	1.00	0.00	0.00
Richness Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00
Morphological Guild (JS)						
% Erect	0.00	0.36	0.19	0.00	1.93	0.00
% Stalked	9.79	1.60	3.70	4.23	9.18	16.92
% Unattached	22.94	27.58	42.02	28.43	6.76	6.57
% Prostrate/Adnate	67.28	70.46	51.95	66.94	74.88	72.22
% Variable	0.00	0.00	2.14	0.40	7.25	4.29
% Unclassified Morphological Guild	45.50	6.33	14.33	17.33	31.00	34.00
Richness Erect	0.00	1.00	1.00	0.00	1.00	0.00

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Metrics

Diatom Metrics

Site	MC01	BC09	BC10	BC10	BC09	BC10
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
Richness Stalked	2.00	5.00	4.00	4.00	4.00	5.00
Richness Unattached	2.00	1.00	2.00	2.00	2.00	2.00
Richness Prostrate/Adnate	13.00	12.00	13.00	17.00	9.00	15.00
Richness Variable	0.00	0.00	2.00	1.00	1.00	1.00
Motility (JS)						
% Highly Motile	1.80	0.88	0.77	1.80	3.33	10.56
% Moderately Motile	4.19	1.76	2.88	2.20	4.76	8.99
% Not Motile	90.42	96.12	93.86	93.41	85.71	71.69
% Variable Motility	3.59	1.23	2.50	2.59	6.19	8.76
% Unclassified Motility	44.33	5.50	13.17	16.50	30.00	25.83
Richness Highly Motile	4.00	4.00	3.00	7.00	4.00	8.00
Richness Moderately Motile	9.00	5.00	8.00	9.00	3.00	8.00
Richness Not Motile	7.00	8.00	11.00	9.00	9.00	13.00
Richness Variable Motility	1.00	5.00	4.00	3.00	4.00	3.00
Pollution Tolerance (LB)						
% Very Tolerant	0.33	0.00	0.17	0.00	5.00	3.17
% Moderately Tolerant	13.17	27.67	39.00	25.00	6.33	11.83
% Sensitive/Intolerant	36.67	62.67	43.33	54.00	10.00	46.00
Richness Very Tolerant	2.00	0.00	1.00	0.00	1.00	2.00
Richness Moderately Tolerant	5.00	7.00	11.00	9.00	5.00	13.00
Richness Sensitive/Intolerant	8.00	6.00	9.00	11.00	8.00	9.00
Pollution Tolerance (Lang-Bertalot modified by Bohls)	2.72	2.69	2.52	2.68	2.23	2.70
Other Measures						
% Rhopalodiales	0.00	0.00	0.00	0.00	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	32.67	60.67	40.67	50.50	1.67	32.67
% Siltation Index	2.33	2.33	2.67	3.50	15.00	22.50
Siltation Richness	10.00	8.00	8.00	14.00	8.00	20.00
% Aerophiles	56.17	93.33	86.33	83.33	62.67	71.50
% Centrics	12.50	25.83	36.00	23.50	4.67	4.67
% Stability Index	15.83	2.50	8.83	4.50	15.00	14.17
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Taxa
Soft Body Algae Identifications

	Site ID	MC01	BC09	BC10	BC10	BC09	BC10
	Device	Rock Scrape	Rock Scrape	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	10-09-2006	10-09-2006	10-09-2006	10-30-2006	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	889-16	889-14	889-15	889-45	5053-44	5053-45
DIATOMS	*Achnanthes* sp.	36	17	15	8	112	36
	Amphora sp.	0	0	0	0	0	0
	Brachysira sp.	*0*	*0*	*0*	*0*	0	0
	Caloneis sp.	0	0	0	0	*0*	*0*
	Cocconeis sp.	2	12	7	8	1	9
	Cyclotella sp.	6	2	2	0	2	1
	Cymatopleura sp.	0	0	0	0	0	0
	Cymbella sp.	3	10	6	11	4	44
	Diatoma sp.	0	0	0	0	0	0
	Epithemia sp.	0	0	1	0	*0*	*0*
	Eucocconeis sp.	0	0	0	0	*0*	*0*
	Eunotia sp.	0	0	0	0	*0*	*0*
	Fragilaria sp.	5	8	7	55	4	6
	Frustulia sp.	0	11	2	0	0	0
	Gomphonema sp.	4	6	6	5	1	6
	Hannaea sp.	*0*	*0*	*0*	*0*	0	0
	Mastogloia sp.	0	0	0	0	*0*	*0*
	Melosira sp.	16	59	45	163	99	33
	Meridion sp.	*0*	*0*	*0*	*0*	0	0
	Navicula sp.	6	7	21	9	2	25
	Nitzschia sp.	8	1	2	0	3	4
	Pinnularia sp.	0	0	0	0	0	0
	Reimeria sinuata	*0*	*0*	*0*	*0*	0	0
	Rhoicosphenia sp.	8	0	4	0	2	0
	Rhopalodia sp.	*0*	*0*	*0*	*0*	0	0
	Stauroneis sp.	0	0	0	0	*0*	*0*
	Surirella sp.	0	0	0	0	0	0
	Synedra sp.	10	13	7	4	7	6
	Tabellaria sp.	0	0	0	0	0	0
	DIATOM SUBTOTAL	**104**	**146**	**125**	**263**	**237**	**170**
SOFT BODY ALGAE	*Anabaena* sp.	0	0	0	0	0	0
	Ankistrodesmus sp.	0	5	5	1	0	8
	Aphanizomenon sp.	*0*	*0*	*0*	*0*	0	0
	Botryococcus sp.	5	2	2	0	0	4
	Characiopsis sp.	0	0	0	0	0	0
	Chlamydononas sp.	25	0	26	15	0	2
	Chlorella sp.	0	0	0	0	0	2
	Chroococcus sp.	10	6	80	2	0	0
	Cladophora sp.	0	55	8	0	*0*	*0*
	Closterium sp.	0	0	0	1	0	0
	Coelastrum sp.	0	0	0	0	0	0
	Cosmarium sp.	1	2	2	0	0	2
	Dictyosphaerium sp.	*0*	*0*	*0*	*0*	0	0
	Dinobryon sp.	*0*	*0*	*0*	*0*	0	0
	Euglena sp.	0	0	1	3	1	1
	Gloeocapsa sp.	0	0	0	0	0	1
	Gongrosira sp.	0	0	0	0	*0*	*0*
	LGBs	*0*	*0*	*0*	*0*	27	67
	Mallomonas sp.	*0*	*0*	*0*	*0*	0	0
	Merismopedia sp.	0	0	0	0	*0*	*0*

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek Taxa

Soft Body Algae Identifications

Site ID	MC01	BC09	BC10	BC10	BC09	BC10
Device	Rock Scrape	Rock Scrape	Rock Scrape	Diatometer	Diatometer	Diatometer
Collection Date	10-09-2006	10-09-2006	10-09-2006	10-30-2006	08-16-2007	08-16-2007
EcoAnalysts Sample ID	889-16	889-14	889-15	889-45	5053-44	5053-45
Microcystis sp.	0	3	0	0	31	24
Microspora sp.	*0*	*0*	*0*	*0*	0	0
Mougeotia sp.	17	58	6	0	0	0
Netrium sp.	*0*	*0*	*0*	*0*	0	1
Oedogonium sp.	0	0	0	0	*0*	*0*
Oocystis sp.	68	8	8	6	4	3
Oscillatoria sp.	22	4	7	0	0	5
Pediastrum sp.	*0*	*0*	*0*	*0*	0	0
Phacus sp.	*0*	*0*	*0*	*0*	0	0
Phormidium sp.	*0*	*0*	*0*	*0*	0	0
Pleurotaenium sp.	*0*	*0*	*0*	*0*	0	2
Protoderma sp.	5	0	0	0	*0*	*0*
Raphidiopsis sp.	*0*	*0*	*0*	*0*	0	0
Rhizoclonium sp.	*0*	*0*	*0*	*0*	0	0
Roya sp.	0	1	0	0	0	0
Scendesmus sp.	0	0	14	0	0	6
Sphanerocystis sp.	7	0	0	0	0	0
Spirogyra sp.	33	0	1	0	*0*	*0*
Staurastrum sp.	0	0	0	0	0	0
Stichosiphon sp.	2	0	0	0	0	0
Stigeoclonium sp.	0	9	2	0	0	2
Synura sp.	*0*	*0*	*0*	*0*	0	0
Tetraedron	*0*	*0*	*0*	*0*	0	0
Ulothrix sp.	0	0	9	0	*0*	*0*
Volvox sp.	1	1	4	9	0	0
Zygnema sp.	*0*	*0*	*0*	*0*	0	0
SOFT BODY SUBTOTAL	**196**	**154**	**175**	**37**	**63**	**130**
GRAND TOTAL	**300**	**300**	**300**	**300**	**300**	**300**

Palmerton Periphyton 2006-2007 MIll Creek and Buckwha Creek Metrics

Soft Body Algae Metrics

Site	MC01	BC09	BC10	BC10	BC09	BC10
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	10-09-2006	10-09-2006	10-30-2006	10-09-2006	08-16-2007	08-16-2007
EcoAnalysts Sample ID	889-16	889-14	889-45	889-15	5053-44	5053-45
Abundance Measures						
Species Richness	23.00	23.00	15.00	28.00	15.00	25.00
Number of Valves Counted	300.00	300.00	300.00	300.00	300.00	300.00
Total Cells Counted	150.00	150.00	150.00	150.00	150.00	150.00
Dominance Measures						
Dominant Taxon	*Oocystis* sp.	*Melosira* sp.	*Melosira* sp.	*Chroococcus* sp.	*Achnanthes* sp.	LGBs
Dominant Taxon Abundance	68.00	59.00	163.00	80.00	112.00	67.00
2nd Dominant Taxon	*Achnanthes* sp.	*Mougeotia* sp.	*Fragilaria* sp.	*Melosira* sp.	*Melosira* sp.	*Cymbella* sp.
2nd Dominant Taxon Abundance	36.00	58.00	55.00	45.00	99.00	44.00
3rd Dominant Taxon	*Spirogyra* sp.	*Cladophora* sp.	*Chlamydononas* sp.	*Chlamydononas* sp.	*Microcystis* sp.	*Achnanthes* sp.
3rd Dominant Taxon Abundance	33.00	55.00	15.00	26.00	31.00	36.00
4th Dominant Taxon	*Chlamydononas* sp.	*Achnanthes* sp.	*Cymbella* sp.	*Navicula* sp.	LGBs	*Melosira* sp.
4th Dominant Taxon Abundance	25.00	17.00	11.00	21.00	27.00	33.00
5th Dominant Taxon	*Oscillatoria* sp.	*Synedra* sp.	*Navicula* sp.	*Achnanthes* sp.	*Synedra* sp.	*Navicula* sp.
5th Dominant Taxon Abundance	22.00	13.00	9.00	15.00	7.00	25.00
% Dominant Taxon	22.67	19.67	54.33	26.67	37.33	22.33
% 2nd Dominant Taxon	12.00	19.33	18.33	15.00	33.00	14.67
% 3rd Dominant Taxon	11.00	18.33	5.00	8.67	10.33	12.00
% 4th Dominant Taxon	8.33	5.67	3.67	7.00	9.00	11.00
% 5th Dominant Taxon	7.33	4.33	3.00	5.00	2.33	8.33
Diversity/Evenness Measures						
Shannon-Weaver H' (log e)	2.63	2.48	1.64	2.65	1.65	2.51
Shannon-Weaver H' (log 10)	1.14	1.08	0.71	1.15	0.72	1.09
Shannon-Weaver H' (log 2)	3.79	3.58	2.36	3.83	2.38	3.62
Margalef's Richness	3.86	3.86	2.45	4.73	2.45	4.21
Other Measures						
% Rhopalodiales	0.00	0.00	0.00	0.33	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	0.00	0.00	0.00	0.00	0.00	0.00
% Siltation Index	4.67	2.67	3.00	7.67	1.67	9.67
Siltation Richness	2.00	2.00	1.00	2.00	2.00	2.00
% Aerophiles	0.00	0.00	0.00	0.00	0.00	0.00
% Centrics	7.33	20.33	54.33	15.67	33.67	11.33
% Stability Index	5.00	7.00	19.67	4.67	3.67	4.00
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2006 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Achnanthes	*Achnanthes biporoma*	0	0	0	0	0	0	0	0	0	0	2	0	0
	Achnanthes clevei	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes conspicua	0	0	0	0	0	0	0	0	0	1	1	0	4
	Achnanthes daonensis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes deflexa	31	6	9	0	18	3	10	4	5	1	5	3	15
	Achnanthes detha	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes exigua	0	0	0	0	0	0	0	1	0	0	0	0	0
	Achnanthes flexella	0	0	1	0	0	0	0	0	0	0	0	0	0
	Achnanthes hauckiana	0	0	0	0	0	0	0	0	0	1	0	0	0
	Achnanthes hauckiana var. *rostrata*	0	0	1	0	0	2	0	3	0	5	3	7	2
	Achnanthes hungarica	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes laevis	0	0	0	0	0	0	2	0	0	0	0	0	0
	Achnanthes lanceolata	0	0	2	0	0	3	0	0	0	0	0	0	1
	Achnanthes lanceolata var. *apiculata*	0	0	0	0	0	0	0	0	0	0	0	0	2
	Achnanthes lanceolata var. *dubia*	0	0	0	0	1	1	0	2	0	3	0	14	3
	Achnanthes linearis	0	0	0	0	0	0	2	0	2	0	2	0	14
	Achnanthes microcephala	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes minutissima	258	222	232	325	247	245	166	231	281	266	241	127	264
	Achnanthes peragalli	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes stewartii	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes subhudsonis	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphora	*Amphora ovalis*	0	0	0	0	0	0	0	0	0	0	2	0	0
	Amphora pediculus	0	0	0	0	0	0	0	1	0	2	1	13	1
	Amphora perpusilla	0	0	0	0	0	0	0	0	0	0	0	0	0
	Amphora submontana	0	0	0	0	0	0	0	0	0	0	0	0	0
Anomoeoneis	*Anomoeoneis brachysira*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Anomoeoneis vitrea	0	0	0	0	0	0	0	0	0	0	0	0	0
Aulacoseira	*Aulacoseira granulata*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Aulacoseira granulata var. *angustissima*	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachysira	*Brachysira neoexilis*	0	0	0	0	0	0	0	0	0	0	0	0	0
Caloneis	*Caloneis bacillum*	0	0	0	0	0	0	0	0	0	0	0	0	0
Cocconeis	*Cocconeis neodiminuta*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cocconeis neothumensis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cocconeis pediculus	0	0	2	0	3	3	3	0	2	6	1	6	1
	Cocconeis placentula	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cocconeis placentula var.	0	0	0	0	0	0	0	0	0	0	0	0	0

Palmerton Periphyton 2006 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
	euglypta													
	Cocconeis placentula var. *intermedia*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cocconeis placentula var. *lineata*	5	3	11	1	10	10	5	23	0	20	33	34	21
	Cocconeis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclotella	*Cyclotella distinguenda*	0	0	0	0	1	0	0	0	0	0	0	1	1
	Cyclotella meneghiniana	0	2	1	0	0	3	1	3	0	3	2	2	1
	Cyclotella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cyclotella stelligera	0	0	0	0	0	0	0	0	0	0	0	2	0
Cymatopleura	*Cymatopleura solea*	0	0	0	0	0	0	0	0	0	2	0	2	0
Cymbella	*Cymbella affinis*	0	0	3	0	0	0	1	0	0	0	0	0	0
	Cymbella aspera	0	0	0	0	0	0	0	0	0	0	0	0	1
	Cymbella cistula	0	1	0	1	1	0	0	0	0	0	0	0	0
	Cymbella cymbiformis	0	1	0	0	0	1	2	3	1	2	1	0	1
	Cymbella excisa	2	1	3	1	2	1	2	3	2	3	6	2	8
	Cymbella gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella lanceolata	0	0	0	0	1	0	1	0	0	0	0	0	0
	Cymbella lunata	0	0	0	0	0	0	0	1	0	0	0	0	0
	Cymbella mexicana	0	0	0	0	0	0	0	0	0	0	0	0	1
	Cymbella microcephala	0	0	1	0	2	0	2	0	1	0	0	0	0
	Cymbella minuta	5	17	6	13	7	6	13	11	8	7	3	10	6
	Cymbella minuta var. *latens*	0	0	0	0	0	0	1	0	0	0	1	0	0
	Cymbella minuta var. *silesiaca*	13	7	2	5	4	4	1	0	1	0	1	4	1
	Cymbella muelleri	0	0	0	0	0	0	0	0	0	0	0	1	0
	Cymbella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella subhelvetica	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella subturgidula	0	0	0	0	0	1	0	0	0	0	0	4	1
	Cymbella triangulum	0	0	3	0	0	0	1	0	0	0	0	0	1
	Cymbella tumida	0	0	0	0	1	1	2	2	1	2	2	6	2
Diatoma	*Diatoma anceps*	0	0	0	0	0	0	0	0	0	1	0	0	0
	Diatoma anceps var. *linearis*	0	0	2	0	1	1	0	0	0	2	0	0	0
	Diatoma hiemalis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma mesdon	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma moniliformis	0	0	0	0	2	0	0	0	0	0	0	0	0
	Diatoma tenue var. *elongatum*	0	0	0	0	0	0	2	0	2	0	0	0	2
	Diatoma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma vulgaris	0	0	3	0	2	0	91	9	87	6	99	9	2
	Diatoma vulgaris var. *brevis*	0	0	0	0	0	0	0	0	0	0	0	0	0

Palmerton Periphyton 2006 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Diploneis	*Diploneis elliptica*	0	0	0	0	0	0	0	0	0	0	0	0	0
Epithemia	*Epithemia turgida*	0	0	0	0	0	0	0	0	0	0	0	0	0
Eunotia	*Eunotia arcus*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia curvata	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia incisa	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia maior	1	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia pectinalis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia pectinalis var. *minor*	0	2	0	2	1	1	0	2	0	3	0	0	2
	Eunotia praerupta	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia serra var. *diadema*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia vanheurckii	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia vanheurckii var. *intermedia*	0	0	0	0	0	0	0	0	0	0	0	0	1
Fragilaria	*Fragilaria brevistriata* var. *inflata*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria capucina	14	2	0	0	0	0	22	0	22	0	0	0	0
	Fragilaria capucina var. *mesolepta*	5	1	0	1	0	0	0	0	0	0	0	0	0
	Fragilaria construens	13	2	0	2	2	0	0	3	0	1	0	7	0
	Fragilaria construens var. *venter*	0	1	9	1	2	2	0	0	0	17	0	9	2
	Fragilaria crotonensis	15	8	5	8	0	0	6	0	6	2	0	0	3
	Fragilaria leptostauron	0	0	2	0	2	1	0	0	0	12	0	13	2
	Fragilaria leptostauron var. *dubia*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria pinnata	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria vaucheriae	2	12	4	7	6	9	0	14	0	5	0	1	1
	Fragilaria vaucheriae var. *capitellata*	8	1	2	1	2	4	4	0	3	0	1	0	4
	Fragilaria virescens	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria virescens var. *capitata*	1	0	0	0	0	0	0	0	0	5	0	0	2
Frustulia	*Frustulia rhomboides*	0	0	0	0	0	1	1	0	1	0	0	1	5
	Frustulia rhomboides var. *capitata*	0	0	1	0	0	0	0	0	0	0	0	0	0
	Frustulia vulgaris	0	1	0	1	0	0	0	0	0	2	0	1	0
	Frustulia vulgaris var. *capitata*	0	0	0	0	0	0	0	0	0	0	1	0	0
Gomphonema	*Gomphonema abbreviatum*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema acuminatum	0	0	0	0	0	0	0	0	0	3	0	0	0
	Gomphonema affine	0	0	0	0	0	0	0	0	0	0	0	2	0
	Gomphonema augur var.	0	0	0	0	0	0	0	0	0	0	0	0	0

Palmerton Periphyton 2006 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
	turris													
	Gomphonema gracile	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema intricatum	0	0	3	0	0	1	0	4	0	3	0	0	0
	Gomphonema minutum	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema parvulum	1	4	6	2	6	12	9	14	5	0	12	7	5
	Gomphonema parvulum var. *saprophilum*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema sphaerophorum	0	0	2	0	1	0	4	0	2	0	0	0	1
	Gomphonema subclavatum var. *mexicanum*	0	0	0	0	0	0	0	0	0	0	0	0	1
Gyrosigma	*Gyrosigma acuminatum*	0	0	0	0	0	0	0	0	0	0	0	2	0
Hannaea	*Hannaea arcus*	0	0	0	0	0	0	0	0	0	0	0	0	0
Hantzschia	*Hantzschia amphioxys*	0	0	0	0	0	0	0	0	0	0	0	0	1
Melosira	*Melosira ambigua*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Melosira varians	67	135	201	131	166	159	158	139	109	67	113	101	91
Meridion	*Meridion circulare*	0	0	8	0	0	0	2	0	0	1	0	0	6
	Meridion circulare var. *constrictum*	3	0	0	0	1	1	2	2	2	3	0	0	3
Navicula	*Navicula amphiceropsis*	0	0	0	0	0	0	0	1	0	1	1	1	0
	Navicula angusta	0	0	0	0	0	0	1	0	1	0	0	0	0
	Navicula arvensis	0	0	0	0	1	0	0	0	0	0	0	1	0
	Navicula atomus	0	0	0	0	0	0	0	0	0	0	0	2	0
	Navicula bacillum	0	1	0	1	0	0	0	0	0	0	0	0	0
	Navicula capitata	0	0	0	0	0	1	0	0	0	0	0	0	0
	Navicula cincta	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula cocconeiformis	0	0	0	0	0	0	0	0	0	0	0	0	1
	Navicula contenta	0	0	1	0	0	1	0	0	0	0	0	0	0
	Navicula cryptocephala	0	0	7	0	2	7	1	6	0	6	0	6	3
	Navicula cuspidata	0	0	0	0	1	0	0	0	0	0	0	0	0
	Navicula decussis	0	0	0	0	1	0	0	0	0	0	0	1	0
	Navicula gregaria	0	0	0	0	2	4	2	0	0	2	2	3	1
	Navicula halophila	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula laevissima	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula meniculus var. *obtusa*	0	0	0	0	0	1	0	0	0	0	0	1	0
	Navicula menisculus	0	0	0	0	0	0	0	0	0	2	0	1	1
	Navicula menisculus var. *upsaliensis*	0	0	1	0	0	1	0	0	0	0	0	1	0
	Navicula mutica	0	0	0	0	0	0	0	0	0	1	0	0	0
	Navicula notha	0	0	0	0	0	0	0	0	0	0	0	0	0

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Diatom Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
	Navicula pelliculosa	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula peregrina	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula phyllepta	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula phylleptosoma	0	0	1	0	0	0	0	0	0	0	0	0	0
	Navicula protracta	0	1	0	1	0	0	0	0	0	0	0	0	0
	Navicula pseudoscutiformis	0	0	0	0	0	1	0	0	0	0	0	2	0
	Navicula pupula	1	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula radiosa	0	0	1	0	0	0	0	0	0	0	0	3	0
	Navicula radiosa var. *parva*	0	0	0	0	0	1	1	5	0	4	0	3	0
	Navicula radiosa var. *tenella*	0	3	2	3	4	7	3	5	1	9	3	6	5
	Navicula rhynchocephala	0	0	0	0	0	1	0	0	0	0	0	0	0
	Navicula rhynchocephala var. *germainii*	0	3	1	3	1	0	6	1	2	1	0	0	0
	Navicula sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula subminuscula	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula submolesta	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula symmetrica	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula tripunctata	0	0	0	0	0	0	0	1	0	0	0	2	3
	Navicula trivialis	0	0	0	0	1	0	0	0	0	0	0	1	1
	Navicula veneta	0	0	0	0	1	1	0	1	0	1	0	1	1
	Navicula vilaplanii	0	0	0	0	1	0	1	0	0	0	0	0	0
	Navicula viridula	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula viridula var. *avenacea*	0	0	0	0	0	0	0	3	0	2	2	0	0
	Navicula viridula var. *linearis*	0	0	0	0	1	1	0	0	0	0	0	2	1
	Navicula viridula var. *rostellata*	0	0	0	0	0	1	0	1	0	0	0	2	1
Neidium	*Neidium hercynicum*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Neidium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitzschia	*Nitzschia abridia*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia acicularis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia amphibia	0	0	0	0	1	3	1	0	0	3	0	1	1
	Nitzschia amphibioides	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia angustata	2	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia capitellata	0	1	0	0	0	1	1	3	0	4	0	8	4
	Nitzschia clausii	0	0	0	0	0	1	0	1	0	0	0	0	0
	Nitzschia communis	0	0	0	0	0	0	2	0	2	0	0	0	4
	Nitzschia dissipata	0	3	0	2	6	4	1	2	1	5	1	4	4
	Nitzschia filiformis	0	0	0	0	0	0	0	2	0	2	1	2	1
	Nitzschia fonticola	0	1	0	1	0	0	0	0	0	3	0	2	2
	Nitzschia frustulum	0	0	0	0	0	0	0	0	0	0	0	0	0

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Diatom Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
	Nitzschia frustulum var. *perminuta*	0	0	0	0	0	0	0	0	0	0	1	0	0
	Nitzschia graciliformis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia gracilis	5	1	2	0	3	1	2	3	2	3	0	6	5
	Nitzschia heufleriana	0	0	0	0	0	0	0	0	0	0	0	1	0
	Nitzschia inconspicua	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia intermedia	0	1	0	0	1	0	0	0	0	2	1	2	0
	Nitzschia lancettula	0	0	0	0	0	0	1	0	1	2	0	0	0
	Nitzschia linearis	0	2	1	0	5	1	0	3	0	11	3	4	5
	Nitzschia microcephala	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia palea	0	2	1	2	1	5	1	1	1	2	0	0	2
	Nitzschia palea var. *debilis*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia pura	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia pusilla	0	0	2	0	0	5	0	1	0	0	0	1	0
	Nitzschia rosenstockii	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia sigma	0	0	0	0	0	0	0	0	0	0	1	0	0
	Nitzschia sinuata	0	0	1	0	0	0	0	0	0	0	0	0	0
	Nitzschia sociabilis	0	0	0	0	0	0	0	1	0	0	0	0	0
	Nitzschia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia subinflata	0	0	0	0	0	0	0	0	0	0	0	0	1
	Nitzschia umbonata	0	0	0	0	0	0	0	0	0	0	0	1	0
Pinnularia	*Pinnularia abaujensis* var. *linearis*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pinnularia biceps var. *pusilla*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pinnularia mesolepta	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pinnularia microstauron	1	1	0	1	0	0	0	0	0	0	0	0	0
	Pinnularia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pinnularia subcapitata	0	1	0	0	0	0	0	0	0	1	0	0	0
Planothidium	*Planothidium frequentissimum*	10	5	4	3	42	5	8	12	0	25	5	9	19
Reimeria	*Reimeria sinuata*	2	0	4	0	1	4	2	5	2	4	1	2	4
Rhoicosphenia	*Rhoicosphenia curvata*	25	35	14	33	5	16	12	7	11	11	11	31	21
Stauroneis	*Stauroneis anceps* f. *linearis*	0	0	0	0	0	0	0	0	0	0	0	1	0
	Stauroneis smithii	0	0	0	0	0	1	0	0	0	2	1	1	0
	Stauroneis tackei	13	9	1	9	1	2	2	1	0	3	0	4	0
Stenopterobia	*Stenopterobia delicatissima*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Surirella	*Surirella angusta*	4	2	0	0	0	1	0	0	0	0	0	0	1
	Surirella brebissonii	0	0	0	0	1	0	0	0	0	1	0	0	0
	Surirella linearis var. *helvetica*	0	0	1	0	1	1	0	0	0	2	0	1	0
	Surirella ovalis	0	0	0	0	0	1	0	2	0	1	0	3	0

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Diatom Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
	Surirella ovata	0	0	0	0	0	0	0	0	0	0	0	0	0
	Surirella ovata var. *crumena*	6	1	0	0	0	0	0	0	0	0	0	0	0
	Surirella ovata var. *pinnata*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Surirella tenera	0	0	1	0	0	0	1	0	0	1	0	0	0
Synedra	*Synedra acus*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra incisa	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra parasitica	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra pulchella	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra rumpens	14	3	7	0	15	14	1	11	1	15	4	75	7
	Synedra rumpens var. *familiaris*	42	45	0	13	0	0	23	17	23	0	12	0	4
	Synedra rumpens var. *fragilarioides*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra rumpens var. *meneghiniana*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra tenera	10	8	2	4	1	2	1	0	1	0	5	0	0
	Synedra ulna	18	33	16	19	4	15	9	26	8	7	8	10	8
	Synedra ulna var. *chaseana*	0	1	2	1	0	0	0	0	0	0	2	0	0
	Synedra ulna var. *contracta*	3	8	2	2	4	12	1	3	0	4	2	1	3
Tabellaria	*Tabellaria fenestrata*	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tabellaria flocculosa	0	0	0	0	0	1	0	0	0	0	0	0	0
	TOTAL	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**

Palmerton Periphyton 2006 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Abundance Measures													
Species Richness	32.00	44.00	50.00	32.00	53.00	59.00	52.00	48.00	34.00	64.00	42.00	68.00	68.00
Number of Valves Counted	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Total Cells Counted	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Dominance Measures													
Dominant Taxon	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*
Dominant Taxon Abundance	258.00	222.00	232.00	325.00	247.00	245.00	166.00	231.00	281.00	266.00	241.00	127.00	264.00
2nd Dominant Taxon	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*	*Melosira varians*
2nd Dominant Taxon Abundance	67.00	135.00	201.00	131.00	166.00	159.00	158.00	139.00	109.00	67.00	113.00	101.00	91.00
3rd Dominant Taxon	*Synedra rumpens* var. *familiaris*	*Synedra rumpens* var. *familiaris*	*Synedra ulna*	*Rhoicosphenia curvata*	*Planothidium frequentissimum*	*Rhoicosphenia curvata*	*Diatoma vulgaris*	*Synedra ulna*	*Diatoma vulgaris*	*Planothidium frequentissimum*	*Diatoma vulgaris*	*Synedra rumpens*	*Cocconeis placentula* var. *lineata*
3rd Dominant Taxon Abundance	42.00	45.00	16.00	33.00	42.00	16.00	91.00	26.00	87.00	25.00	99.00	75.00	21.00
4th Dominant Taxon	*Achnanthes deflexa*	*Rhoicosphenia curvata*	*Rhoicosphenia curvata*	*Synedra ulna*	*Achnanthes deflexa*	*Synedra ulna*	*Synedra rumpens* var. *familiaris*	*Cocconeis placentula* var. *lineata*	*Synedra rumpens* var. *familiaris*	*Cocconeis placentula* var. *lineata*	*Cocconeis placentula var. lineata*	*Cocconeis placentula var. lineata*	*Rhoicosphenia curvata*
4th Dominant Taxon Abundance	31.00	35.00	14.00	19.00	18.00	15.00	23.00	23.00	23.00	20.00	33.00	34.00	21.00
5th Dominant Taxon	*Rhoicosphenia curvata*	*Synedra ulna*	*Cocconeis placentula* var. *lineata*	*Cymbella minuta*	*Synedra rumpens*	*Synedra rumpens*	*Fragilaria capucina*	*Synedra rumpens* var. *familiaris*	*Fragilaria capucina*	*Fragilaria construens* var. *venter*	*Gomphonema parvulum*	*Rhoicosphenia curvata*	*Planothidium frequentissimum*
5th Dominant Taxon Abundance	25.00	33.00	11.00	13.00	15.00	14.00	22.00	17.00	22.00	17.00	12.00	31.00	19.00
% Dominant Taxon	43.00	37.00	38.67	54.17	41.17	40.83	27.67	38.50	46.83	44.33	40.17	21.17	44.00
% 2nd Dominant Taxon	11.17	22.50	33.50	21.83	27.67	26.50	26.33	23.17	18.17	11.17	18.83	16.83	15.17
% 3rd Dominant Taxon	7.00	7.50	2.67	5.50	7.00	2.67	15.17	4.33	14.50	4.17	16.50	12.50	3.50
% 4th Dominant Taxon	5.17	5.83	2.33	3.17	3.00	2.50	3.83	3.83	3.83	3.33	5.50	5.67	3.50
% 5th Dominant Taxon	4.17	5.50	1.83	2.17	2.50	2.33	3.67	2.83	3.67	2.83	2.00	5.17	3.17
Diversity/Evenness Measures													
Shannon-Weaver H' (log e)	2.32	2.26	2.06	1.67	2.09	2.25	2.38	2.35	1.85	2.61	2.07	3.04	2.52
Shannon-Weaver H' (log 10)	1.01	0.98	0.90	0.72	0.91	0.98	1.04	1.02	0.80	1.13	0.90	1.32	1.09
Shannon-Weaver H' (log 2)	3.34	3.25	2.97	2.40	3.01	3.24	3.44	3.39	2.67	3.77	2.99	4.38	3.64
Margalef's Richness	4.85	6.72	7.66	4.85	8.13	9.07	7.97	7.35	5.16	9.85	6.41	10.47	10.47

Palmerton Periphyton 2006 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Van Dam Indices													
Van Dam pH	3.31	3.37	3.51	3.29	3.46	3.41	3.74	3.45	3.56	3.41	3.69	3.64	3.36
Van Dam Salinity	1.98	1.98	2.00	1.99	2.01	2.03	2.00	2.04	2.00	2.04	2.02	2.07	1.99
Van Dam Nitrogen Uptake	2.11	2.32	2.38	2.26	2.34	2.36	2.34	2.31	2.22	2.11	2.21	2.22	2.19
Van Dam Oxygen Tolerance	1.46	1.81	1.95	1.61	1.88	1.96	2.03	1.92	1.67	1.60	1.86	2.04	1.69
Van Dam Saprobity	2.14	2.34	2.42	2.28	2.38	2.44	2.36	2.38	2.23	2.15	2.25	2.31	2.24
Van Dam Trophic State	5.77	5.89	5.79	6.27	5.86	5.96	5.27	5.86	5.72	5.92	5.63	5.44	5.96
Van Dam Moisture	2.60	2.56	2.44	2.66	2.54	2.59	2.17	2.55	2.38	2.56	2.30	2.34	2.60
pH Preference													
% at Optimal Occurance pH 5.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Mainly Occuring at pH<7	2.23	2.52	0.37	1.19	0.40	0.99	0.57	0.61	0.55	0.80	0.91	0.24	1.38
% Mainly Occuring at pH~7	64.73	57.67	49.16	68.25	53.16	56.94	42.37	56.21	59.23	60.08	48.18	39.57	61.54
% Mainly Occuring at pH>7	33.04	39.82	49.72	30.56	46.05	41.67	39.69	40.73	24.31	36.73	32.30	55.92	36.29
% Exclusively Occuring at pH>7	0.00	0.00	0.75	0.00	0.40	0.40	17.37	2.44	15.90	2.40	18.61	4.27	0.79
% at no Apparent Optimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified pH	25.33	27.17	10.83	16.00	15.67	16.00	12.67	18.17	8.83	16.50	8.67	29.67	15.50
Richness at pH <5.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Richness at pH <7	1.00	3.00	1.00	2.00	2.00	4.00	3.00	2.00	3.00	2.00	1.00	1.00	2.00
Richness at pH ~7	10.00	10.00	11.00	6.00	9.00	10.00	11.00	10.00	9.00	12.00	9.00	12.00	13.00
Richness at pH >7	9.00	18.00	20.00	13.00	24.00	26.00	19.00	20.00	11.00	31.00	17.00	33.00	29.00
Richness Exclusively at pH >7	0.00	0.00	2.00	0.00	1.00	1.00	1.00	2.00	1.00	3.00	2.00	3.00	2.00
Richness at no Optimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salinity Preference													
% Fresh	3.47	2.47	0.93	1.17	0.99	1.19	1.34	1.22	0.92	2.38	1.47	1.63	3.85
% Fresh-Brackish	95.23	96.64	98.14	98.64	97.04	95.85	97.14	95.73	98.35	92.86	96.34	92.54	94.12
% Brackish-Fresh	1.30	0.90	0.56	0.19	1.97	2.17	1.53	0.81	0.73	2.78	0.92	3.03	1.42
% Brackish	0.00	0.00	0.37	0.00	0.00	0.79	0.00	2.24	0.00	1.98	1.28	2.80	0.61
% Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Salinity	23.17	25.67	10.50	14.50	15.50	15.67	12.67	18.00	9.17	16.00	9.00	28.50	17.83
Richness Fresh	3.00	3.00	3.00	2.00	3.00	5.00	5.00	3.00	4.00	4.00	3.00	2.00	6.00

Palmerton Periphyton 2006 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Richness Fresh-Brackish	17.00	26.00	29.00	19.00	28.00	30.00	25.00	25.00	17.00	35.00	18.00	42.00	31.00
Richness Brackish-Fresh	1.00	3.00	2.00	1.00	6.00	4.00	4.00	2.00	2.00	6.00	3.00	5.00	6.00
Richness Brackish	0.00	0.00	2.00	0.00	0.00	3.00	0.00	5.00	0.00	4.00	4.00	3.00	2.00
Richness Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Uptake Metabolism													
% Very Small Tolerance N	7.09	3.45	3.11	1.84	2.75	2.04	3.16	3.44	1.57	5.77	3.02	8.72	5.22
% Elevated Tolerance N	75.07	61.33	56.23	70.49	60.47	60.74	60.55	62.37	75.39	77.78	72.83	61.54	71.96
% Needing Periodically Elevated N	17.85	34.73	40.47	27.25	36.58	36.20	35.65	33.98	22.44	16.03	24.15	28.97	21.52
% Needing Continuously Elevated N	0.00	0.49	0.19	0.41	0.21	1.02	0.63	0.22	0.59	0.43	0.00	0.77	1.30
% Unclassified Nitrogen	36.50	32.33	14.33	18.67	21.17	18.50	21.00	22.50	15.33	22.00	11.67	35.00	23.33
Richness at Small Tolerance N	4.00	6.00	8.00	5.00	9.00	9.00	10.00	6.00	7.00	8.00	6.00	8.00	8.00
Richness at Elevated Tolerance N	7.00	13.00	15.00	10.00	15.00	20.00	12.00	17.00	8.00	23.00	12.00	25.00	23.00
Richness at Periodic Elevated N	2.00	3.00	3.00	2.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	5.00	5.00
Richness at Continuously Elevated N	0.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	1.00	0.00	2.00	2.00
Oxygen Requirements													
% at Continuously High Oxygen	73.21	57.84	50.68	68.44	55.04	53.47	38.36	54.06	57.06	66.74	48.68	43.43	62.45
% at Fairly High Oxygen	7.65	5.64	5.03	3.28	4.41	3.67	23.48	5.13	19.61	9.53	20.38	14.39	8.37
% at Moderate Oxygen	18.88	34.56	42.75	27.46	38.45	37.35	35.43	36.32	22.16	21.82	27.92	37.88	27.04
% at Low Oxygen	0.26	1.47	1.35	0.82	2.10	4.90	2.52	3.85	1.18	1.27	2.64	3.54	1.93
% at Very Low Oxygen	0.00	0.49	0.19	0.00	0.00	0.61	0.21	0.64	0.00	0.64	0.38	0.76	0.21
% Unclassified Oxygen	34.67	32.00	13.83	18.67	20.67	18.33	20.50	22.00	15.00	21.33	11.67	34.00	22.33
Richness at High Oxygen	6.00	7.00	12.00	6.00	11.00	13.00	12.00	9.00	9.00	12.00	8.00	12.00	11.00
Richness at Fairly High Oxygen	4.00	10.00	10.00	6.00	7.00	9.00	8.00	11.00	6.00	13.00	7.00	14.00	14.00
Richness at Moderate Oxygen	4.00	5.00	4.00	4.00	7.00	6.00	6.00	4.00	3.00	8.00	4.00	9.00	10.00
Richness at Low	1.00	2.00	2.00	2.00	4.00	6.00	3.00	4.00	2.00	4.00	2.00	4.00	4.00

Palmerton Periphyton 2006 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Oxygen													
Richness at Very Low Oxygen	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	2.00	1.00
Saprobity													
% Very Slightly Polluted	2.96	2.66	1.93	1.22	1.88	1.83	2.20	2.55	1.13	5.22	1.88	5.47	3.85
% Moderately Polluted	80.05	62.71	56.07	71.22	59.92	57.61	62.32	61.49	76.50	75.99	73.45	61.69	71.31
% Moderate-Heavily Polluted	16.75	32.69	40.46	26.73	36.53	36.31	32.87	31.91	20.86	17.54	22.03	29.60	22.06
% Heavily Polluted	0.25	1.45	1.35	0.41	1.46	3.25	2.40	3.83	1.32	0.84	2.64	2.99	2.36
% Very Heavily Polluted	0.00	0.48	0.19	0.41	0.21	1.01	0.20	0.21	0.19	0.42	0.00	0.25	0.43
% Unclassified Saprobity	32.33	31.17	13.50	18.33	20.17	17.83	16.83	21.67	11.33	20.17	11.50	33.00	22.17
Richness Very Slightly Polluted	2.00	3.00	6.00	2.00	7.00	8.00	7.00	5.00	6.00	7.00	5.00	5.00	8.00
Richness Moderately Polluted	11.00	21.00	19.00	14.00	15.00	18.00	15.00	16.00	10.00	23.00	12.00	27.00	17.00
Richness Moderate-Heavily Polluted	2.00	1.00	3.00	1.00	7.00	8.00	5.00	5.00	2.00	8.00	4.00	9.00	10.00
Richness Heavily Polluted	1.00	2.00	2.00	1.00	2.00	3.00	3.00	3.00	2.00	2.00	2.00	4.00	4.00
Richness Very Heavily Polluted	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Trophic State													
% Oligotrophic	0.00	0.00	0.95	0.00	0.20	0.61	0.79	0.84	0.37	1.25	0.37	0.50	1.04
% Oligo-Mesotrophic	2.29	2.40	0.38	0.82	0.20	0.61	0.59	0.84	0.37	0.63	1.30	0.00	0.42
% Mesotrophic	15.79	4.08	3.98	1.64	4.44	1.82	8.25	2.53	6.89	2.08	1.11	3.23	5.63
% Meso-Eutrophic	3.20	2.64	3.23	1.64	4.64	2.23	18.86	4.00	16.76	12.29	19.44	15.38	3.96
% Eutrophic	19.45	36.93	43.83	28.69	39.92	41.09	37.92	41.26	23.09	25.83	32.78	46.40	30.42
% Hypereutrophic	0.00	0.48	0.19	0.41	0.20	1.01	0.20	0.21	0.19	0.42	0.00	0.74	0.42
% Oligo-to-Eutrophic	59.27	53.48	47.44	66.80	50.40	52.63	33.40	50.32	52.33	57.50	45.00	33.75	58.12
% Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Trophic	27.17	30.50	12.17	18.67	17.33	17.67	15.17	20.83	10.50	20.00	10.00	32.83	20.00
Richness Oligotrophic	0.00	0.00	3.00	0.00	1.00	3.00	3.00	1.00	2.00	3.00	1.00	2.00	1.00
Richness Oligo-Mesotrophic	1.00	3.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	3.00	0.00	2.00
Richness Mesotrophic	6.00	4.00	5.00	1.00	3.00	4.00	5.00	3.00	5.00	4.00	2.00	4.00	4.00
Richness Meso-Eutrophic	2.00	7.00	6.00	6.00	9.00	7.00	4.00	5.00	4.00	9.00	4.00	13.00	7.00
Richness Eutrophic	6.00	11.00	10.00	7.00	14.00	14.00	13.00	15.00	7.00	19.00	13.00	19.00	19.00

Palmerton Periphyton 2006 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Richness Hypereutrophic	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	2.00	1.00
Richness Oligo-to-Eutrophic	2.00	2.00	5.00	2.00	3.00	6.00	4.00	4.00	1.00	5.00	3.00	5.00	6.00
Richness Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moisture													
% Never Outside Water	8.93	3.65	5.83	2.65	4.17	1.43	23.06	3.84	19.61	9.83	19.89	12.94	6.42
% Mainly in Water, Sometimes Wet	21.68	37.47	44.85	28.78	38.33	38.09	37.53	38.17	22.94	24.90	30.21	41.04	28.69
% Mainly in Water, Regularly Wet	69.39	58.39	49.13	68.16	57.29	60.08	38.99	57.57	57.06	64.44	49.91	45.52	63.38
% Mainly Wet, Moist or Temporarily Dry	0.00	0.49	0.19	0.41	0.21	0.41	0.42	0.43	0.39	0.84	0.00	0.50	1.50
% Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Moisture	34.67	31.50	14.17	18.33	20.00	18.17	20.50	21.83	15.00	20.33	11.17	33.00	22.17
Richness Never Outside Water	4.00	7.00	7.00	5.00	12.00	4.00	9.00	5.00	6.00	13.00	6.00	11.00	11.00
Richness Mainly in Water, Sometimes Wet	5.00	8.00	9.00	6.00	7.00	11.00	11.00	8.00	7.00	10.00	7.00	11.00	10.00
Richness Mainly in Water, Regularly Wet	6.00	11.00	12.00	7.00	13.00	19.00	9.00	16.00	6.00	16.00	11.00	22.00	16.00
Richness Mainly Wet, Moist or Temporarily Dry	0.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	2.00	0.00	1.00	3.00
Richness Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Morphological Guild (JS)													
% Erect	0.00	0.00	1.60	0.00	0.00	0.00	0.39	0.00	0.00	0.23	0.00	0.00	1.30
% Stalked	1.40	5.40	3.20	3.20	3.70	4.17	5.91	6.73	2.97	3.20	3.64	6.78	3.24
% Unattached	15.58	32.16	41.00	26.20	34.77	33.96	49.21	33.86	36.43	17.35	43.23	31.17	20.52
% Prostrate/Adnate	73.26	59.62	52.80	68.60	60.70	61.67	38.98	58.74	55.39	75.80	53.13	56.64	73.87
% Variable	9.77	2.82	1.40	2.00	0.82	0.21	5.51	0.67	5.20	3.42	0.00	5.42	1.08
% Unclassified Morphological Guild	28.33	29.00	16.67	16.67	19.00	20.00	15.33	25.67	10.33	27.00	17.50	38.50	22.83
Richness Erect	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00
Richness Stalked	2.00	4.00	4.00	3.00	6.00	4.00	7.00	4.00	5.00	4.00	4.00	4.00	5.00
Richness Unattached	1.00	2.00	3.00	1.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	5.00	4.00
Richness	8.00	15.00	15.00	9.00	17.00	23.00	16.00	17.00	10.00	26.00	14.00	31.00	25.00

Palmerton Periphyton 2006 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Prostrate/Adnate Richness Variable	3.00	3.00	2.00	2.00	2.00	1.00	2.00	1.00	2.00	3.00	0.00	2.00	2.00
Motility (JS)													
% Highly Motile	3.71	2.93	1.52	0.98	3.61	4.42	1.52	3.38	1.09	7.71	1.54	7.95	5.32
% Moderately Motile	3.71	3.84	3.24	3.13	2.61	5.02	3.22	5.27	1.09	7.28	2.12	12.56	4.29
% Not Motile	91.05	88.26	92.19	92.58	90.78	88.35	90.72	86.71	95.45	81.37	94.04	73.59	85.69
% Variable Motility	1.53	4.97	3.05	3.32	3.01	2.21	4.55	4.64	2.36	3.64	2.31	5.90	4.70
% Unclassified Motility	23.67	26.17	12.50	14.67	16.83	17.00	12.00	21.00	8.33	22.17	13.33	35.00	18.50
Richness Highly Motile	4.00	8.00	6.00	3.00	7.00	9.00	6.00	9.00	4.00	12.00	6.00	13.00	10.00
Richness Moderately Motile	4.00	7.00	8.00	6.00	11.00	12.00	9.00	10.00	4.00	15.00	8.00	19.00	10.00
Richness Not Motile	9.00	11.00	18.00	8.00	13.00	14.00	15.00	10.00	12.00	16.00	14.00	13.00	18.00
Richness Variable Motility	2.00	5.00	5.00	4.00	7.00	6.00	8.00	6.00	5.00	5.00	4.00	5.00	9.00
Pollution Tolerance (LB)													
% Very Tolerant	2.33	0.67	0.17	0.00	1.17	0.33	3.67	0.50	3.67	2.17	0.67	1.50	1.00
% Moderately Tolerant	19.83	28.00	37.83	26.33	30.67	30.50	30.33	26.67	20.50	17.00	22.33	24.67	21.17
% Sensitive/Intolerant	48.67	42.33	45.67	57.83	45.50	47.83	34.00	46.00	50.17	52.00	43.00	30.17	51.17
Richness Very Tolerant	1.00	2.00	1.00	0.00	3.00	2.00	1.00	1.00	1.00	2.00	2.00	5.00	2.00
Richness Moderately Tolerant	6.00	9.00	11.00	8.00	11.00	13.00	13.00	12.00	7.00	16.00	12.00	16.00	15.00
Richness Sensitive/Intolerant	9.00	12.00	19.00	8.00	15.00	19.00	16.00	15.00	9.00	18.00	9.00	18.00	17.00
Pollution Tolerance (Lang-Bertalot modified by Bohls)	2.65	2.59	2.54	2.69	2.57	2.60	2.45	2.62	2.63	2.70	2.64	2.51	2.68
Other Measures													
% Rhopalodiales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	43.00	37.00	38.67	54.17	41.17	40.83	27.67	38.50	46.83	44.33	40.17	21.17	44.00
% Siltation Index	3.00	3.67	3.83	2.17	5.83	8.50	4.00	7.17	1.67	11.50	2.67	12.33	8.00
Siltation Richness	5.00	13.00	14.00	7.00	19.00	23.00	14.00	19.00	7.00	23.00	10.00	30.00	21.00
% Aerophiles	66.17	70.83	84.17	83.83	79.00	81.50	83.00	76.00	89.17	76.00	81.83	60.83	75.83
% Centrics	11.17	22.83	33.67	21.83	27.83	27.00	26.50	23.67	18.17	11.67	19.17	17.67	15.50
% Stability Index	24.17	20.83	9.33	9.83	7.17	10.17	26.67	13.83	25.50	12.83	22.17	20.83	6.67
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2006 Aquashicola Creek Taxa
Soft Body Algae Identifications

	Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
	Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
	Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
	EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
DIATOMS	*Achnanthes* sp.	0	14	19	31	17	26	47	26	15	20	0	33	33
	Amphora sp.	0	0	0	0	0	0	0	0	0	2	0	0	0
	Brachysira sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Caloneis sp.	0	0	0	0	0	1	0	0	0	0	0	0	0
	Cocconeis sp.	0	0	12	4	11	5	5	1	3	12	4	12	15
	Cyclotella sp.	0	0	1	2	0	0	2	0	0	3	2	0	3
	Cymatopleura sp.	0	0	0	0	0	0	0	0	0	1	0	0	0
	Cymbella sp.	2	5	13	6	7	2	20	7	8	8	7	14	26
	Diatoma sp.	0	0	5	0	0	1	11	11	10	3	32	14	3
	Epithemia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eucocconeis sp.	0	1	0	0	0	0	0	1	0	0	0	1	0
	Eunotia sp.	0	0	2	2	0	0	0	0	0	0	0	0	0
	Fragilaria sp.	0	9	13	37	6	5	27	6	6	53	5	1	12
	Frustulia sp.	0	0	0	0	2	0	1	0	0	5	4	0	4
	Gomphonema sp.	0	3	2	1	1	1	4	3	3	0	3	2	8
	Hannaea sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Mastogloia sp.	0	0	0	0	0	224	0	162	0	0	0	0	0
	Melosira sp.	3	3	137	37	156	7	60	13	76	131	37	107	20
	Meridion sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula sp.	1	12	8	2	9	6	13	19	14	17	7	32	35
	Nitzschia sp.	1	13	8	7	2	5	1	9	3	7	3	23	5
	Pinnularia sp.	0	0	0	0	0	1	0	0	0	0	1	0	0
	Reimeria sinuata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Rhoicosphenia sp.	0	0	0	1	0	0	0	0	0	0	0	0	6
	Rhopalodia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stauroneis sp.	0	0	0	0	0	0	0	1	0	0	0	0	1
	Surirella sp.	2	2	1	0	0	0	0	0	0	3	0	1	0
	Synedra sp.	11	73	16	18	9	6	18	8	4	10	17	17	4
	Tabellaria sp.	0	0	0	2	0	0	0	0	0	0	0	0	0
	DIATOM SUBTOTAL	**20**	**135**	**237**	**150**	**220**	**290**	**209**	**267**	**142**	**275**	**122**	**257**	**175**
SOFT BODY ALGAE	*Anabaena* sp.	0	4	0	2	0	0	0	0	0	0	0	0	0
	Ankistrodesmus sp.	3	0	1	2	0	0	2	0	0	0	4	0	0
	Aphanizomenon sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Botryococcus sp.	0	0	0	0	0	0	16	0	0	0	0	0	0
	Characiopsis sp.	0	2	0	0	0	0	0	0	0	0	0	0	0
	Chlamydononas sp.	51	6	5	20	3	0	0	5	8	11	19	9	19

Palmerton Periphyton 2006 Aquashicola Creek Taxa
Soft Body Algae Identifications

Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Chlorella sp.	0	0	0	0	0	0	4	1	0	0	0	0	0
Chroococcus sp.	10	6	5	11	0	0	9	2	0	3	5	0	15
Cladophora sp.	0	0	0	0	15	2	0	0	0	0	0	0	0
Closterium sp.	0	0	1	3	1	0	2	1	2	0	3	0	1
Coelastrum sp.	0	0	1	0	0	1	1	0	0	0	0	2	0
Cosmarium sp.	1	2	5	9	2	1	2	0	0	0	2	0	0
Dictyosphaerium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Dinobryon sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Euglena sp.	5	3	4	6	4	0	0	3	3	3	0	5	4
Gloeocapsa sp.	0	14	0	0	0	0	8	0	2	0	1	0	0
Gongrosira sp.	37	27	0	27	0	0	0	0	0	0	0	0	0
LGBs	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mallomonas sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Merismopedia sp.	0	0	0	0	22	0	0	0	0	0	0	0	0
Microcystis sp.	0	0	0	7	0	0	3	0	0	0	0	0	2
Microspora sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mougeotia sp.	0	0	0	0	17	0	0	2	0	0	0	0	5
Netrium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Oedogonium sp.	0	0	1	0	0	0	0	0	0	0	0	0	0
Oocystis sp.	41	16	10	7	2	0	5	5	5	3	6	13	14
Oscillatoria sp.	26	28	13	33	7	3	2	3	12	3	2	11	41
Pediastrum sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Phacus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Phormidium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Pleurotaenium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Protoderma sp.	6	11	0	4	0	0	2	0	9	0	12	0	4
Raphidiopsis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Rhizoclonium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Roya sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Scendesmus sp.	86	7	12	3	0	0	5	2	7	0	10	0	0
Sphanerocystis sp.	11	12	0	5	0	0	11	0	4	0	12	0	15
Spirogyra sp.	0	0	0	0	2	0	0	0	0	0	0	0	0
Staurastrum sp.	0	1	0	3	0	0	0	0	0	0	0	0	0
Stichosiphon sp.	0	0	0	0	2	0	0	0	0	0	0	0	0
Stigeoclonium sp.	0	17	5	5	0	3	19	0	3	0	3	0	4
Synura sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Tetraedron	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Ulothrix sp.	0	6	0	0	3	0	0	0	103	0	99	0	0
Volvox sp.	3	3	0	3	0	0	0	9	0	2	0	3	1
Zygnema sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Periphyton 2006 Aquashicola Creek Taxa
Soft Body Algae Identifications

Site ID	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
SOFT BODY SUBTOTAL	280	165	63	150	80	10	91	33	158	25	178	43	125
GRAND TOTAL	300	300	300	300	300	300	300	300	300	300	300	300	300

Palmerton Periphyton 2006 Aquashicola Creek Metrics
Soft Body Algae Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
Abundance Measures													
Species Richness	18.00	27.00	25.00	30.00	22.00	18.00	27.00	23.00	21.00	20.00	25.00	18.00	26.00
Number of Valves Counted	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Total Cells Counted	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Dominance Measures													
Dominant Taxon	*Scenedesmus* sp.	*Synedra* sp.	*Melosira* sp.	*Fragilaria* sp.	*Melosira* sp.	*Mastogloia* sp.	*Melosira* sp.	*Mastogloia* sp.	*Ulothrix* sp.	*Melosira* sp.	*Ulothrix* sp.	*Melosira* sp.	*Oscillatoria* sp.
Dominant Taxon Abundance	86.00	73.00	137.00	37.00	156.00	224.00	60.00	162.00	103.00	131.00	99.00	107.00	41.00
2nd Dominant Taxon	*Chlamydononas* sp.	*Oscillatoria* sp.	*Achnanthes* sp.	*Melosira* sp.	*Merismopedia* sp.	*Achnanthes* sp.	*Achnanthes* sp.	*Achnanthes* sp.	*Melosira* sp.	*Fragilaria* sp.	*Melosira* sp.	*Achnanthes* sp.	*Navicula* sp.
2nd Dominant Taxon Abundance	51.00	28.00	19.00	37.00	22.00	26.00	47.00	26.00	76.00	53.00	37.00	33.00	35.00
3rd Dominant Taxon	*Oocystis* sp.	*Gongrosira* sp.	*Synedra* sp.	*Oscillatoria* sp.	*Achnanthes* sp.	*Melosira* sp.	*Fragilaria* sp.	*Navicula* sp.	*Achnanthes* sp.	*Achnanthes* sp.	*Diatoma* sp.	*Navicula* sp.	*Achnanthes* sp.
3rd Dominant Taxon Abundance	41.00	27.00	16.00	33.00	17.00	7.00	27.00	19.00	15.00	20.00	32.00	32.00	33.00
4th Dominant Taxon	*Gongrosira* sp.	*Stigeoclonium* sp.	*Cymbella* sp.	*Achnanthes* sp.	*Mougeotia* sp.	*Navicula* sp.	*Cymbella* sp.	*Melosira* sp.	*Navicula* sp.	*Navicula* sp.	*Chlamydononas* sp.	*Nitzschia* sp.	*Cymbella* sp.
4th Dominant Taxon Abundance	37.00	17.00	13.00	31.00	17.00	6.00	20.00	13.00	14.00	17.00	19.00	23.00	26.00
5th Dominant Taxon	*Oscillatoria* sp.	*Oocystis* sp.	*Fragilaria* sp.	*Gongrosira* sp.	*Cladophora* sp.	*Synedra* sp.	*Stigeoclonium* sp.	*Diatoma* sp.	*Oscillatoria* sp.	*Cocconeis* sp.	*Synedra* sp.	*Synedra* sp.	*Melosira* sp.
5th Dominant Taxon Abundance	y	16.00	13.00	27.00	15.00	6.00	19.00	11.00	12.00	12.00	17.00	17.00	20.00
% Dominant Taxon	28.67	24.33	45.67	12.33	52.00	74.67	20.00	54.00	34.33	43.67	33.00	35.67	13.67
% 2nd Dominant Taxon	17.00	9.33	6.33	12.33	7.33	8.67	15.67	8.67	25.33	17.67	12.33	11.00	11.67
% 3rd Dominant Taxon	13.67	9.00	5.33	11.00	5.67	2.33	9.00	6.33	5.00	6.67	10.67	10.67	11.00
% 4th Dominant Taxon	12.33	5.67	4.33	10.33	5.67	2.00	6.67	4.33	4.67	5.67	6.33	7.67	8.67
% 5th Dominant Taxon	8.67	5.33	4.33	9.00	5.00	2.00	6.33	3.67	4.00	4.00	5.67	5.67	6.67
Diversity/Evenness Measures													
Shannon-Weaver H' (log e)	2.17	2.78	2.24	2.88	1.98	1.15	2.71	1.92	2.19	2.04	2.46	2.22	2.84
Shannon-Weaver H' (log 10)	0.94	1.21	0.97	1.25	0.86	0.50	1.18	0.83	0.95	0.88	1.07	0.97	1.23
Shannon-Weaver H' (log 2)	3.12	4.01	3.23	4.15	2.86	1.66	3.91	2.77	3.17	2.94	3.54	3.21	4.09
Margalef's Richness	2.98	4.56	4.21	5.08	3.68	2.98	4.56	3.86	3.51	3.33	4.21	2.98	4.38
Other Measures													
% Rhopalodiales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Siltation Index	1.33	9.00	5.67	3.00	3.67	3.67	4.67	9.33	5.67	9.00	3.33	18.67	13.33
Siltation Richness	3.00	3.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	3.00	2.00

Palmerton Periphyton 2006 Aquashicola Creek Metrics

Soft Body Algae Metrics

Site	AC01	AC02/03	AC04	AC04	AC05	AC05-dry	AC05	AC06	AC06	AC07	AC07	AC07b	AC08
Device	Rock Scrape	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	10-11-2006	10-11-2006	10-30-2006	10-10-2006	10-30-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-10-2006	10-30-2006	10-09-2006
EcoAnalysts Sample ID	889-17	889-18	889-49	889-19	889-50	889-61	889-20	889-41	889-11	889-42	889-12	889-62	889-13
% Aerophiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Centrics	1.00	1.00	46.00	13.00	52.00	2.33	20.67	4.33	25.33	44.67	13.00	35.67	7.67
% Stability Index	3.67	27.33	11.33	19.00	5.00	4.00	18.67	8.33	6.67	22.00	18.00	10.67	6.33
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2007 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-1	5053-37	5053-2	5053-38	5053-3	5053-39	5053-4	5053-40	5053-5	5053-41	5053-42	5053-43
Achnanthes	*Achnanthes biporoma*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes clevei	0	0	0	0	1	2	1	0	0	0	0	6
	Achnanthes conspicua	0	0	0	0	0	0	0	0	1	0	0	0
	Achnanthes daonensis	0	0	0	0	0	1	0	1	0	0	4	0
	Achnanthes deflexa	0	0	0	2	0	4	0	5	5	3	0	2
	Achnanthes detha	0	4	0	0	0	0	0	0	0	0	0	0
	Achnanthes exigua	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes flexella	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes hauckiana	0	0	0	0	2	0	1	0	0	1	7	0
	Achnanthes hauckiana var. *rostrata*	2	0	0	0	4	0	0	0	4	0	2	0
	Achnanthes hungarica	0	0	0	0	0	4	0	0	0	0	0	0
	Achnanthes laevis	0	10	0	0	0	8	0	1	0	2	0	0
	Achnanthes lanceolata	0	2	0	0	2	0	0	0	1	2	0	0
	Achnanthes lanceolata var. *apiculata*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes lanceolata var. *dubia*	0	4	0	0	0	2	0	0	0	0	27	8
	Achnanthes linearis	5	6	2	3	8	12	6	2	2	6	7	2
	Achnanthes microcephala	0	0	0	0	0	6	0	0	0	0	0	0
	Achnanthes minutissima	395	233	456	269	241	135	350	193	164	290	191	155
	Achnanthes peragalli	0	0	0	4	0	0	0	0	0	0	1	0
	Achnanthes sp.	0	2	0	0	4	0	0	2	0	0	0	2
	Achnanthes stewartii	0	0	2	0	0	0	0	0	0	0	0	0
	Achnanthes subhudsonis	4	2	2	4	1	9	0	7	0	14	8	0
Amphora	*Amphora ovalis*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Amphora pediculus	0	4	0	3	3	7	1	5	4	0	3	7
	Amphora perpusilla	0	0	0	0	0	0	0	0	0	0	0	0
	Amphora submontana	0	0	0	0	1	0	0	0	0	0	2	0
Anomoeoneis	*Anomoeoneis brachysira*	0	0	0	0	0	0	0	0	0	0	0	0
	Anomoeoneis vitrea	0	0	0	0	0	0	0	0	0	0	0	0
Aulacoseira	*Aulacoseira granulata*	0	0	0	0	0	0	0	0	0	0	0	0
	Aulacoseira granulata var. *angustissima*	0	0	0	0	0	0	0	0	0	0	0	0
Brachysira	*Brachysira neoexilis*	0	0	0	0	0	0	0	0	0	0	0	0
Caloneis	*Caloneis bacillum*	0	0	0	0	0	0	0	0	0	0	0	0
Cocconeis	*Cocconeis neodiminuta*	0	0	0	0	0	0	0	0	0	1	0	0
	Cocconeis neothumensis	0	0	0	0	0	0	0	0	0	0	0	11
	Cocconeis pediculus	0	0	0	0	0	11	0	7	0	0	2	0
	Cocconeis placentula	3	0	0	0	2	0	0	4	0	4	1	0
	Cocconeis placentula var. *euglypta*	0	2	0	0	0	12	0	2	0	11	8	34
	Cocconeis placentula var. *intermedia*	0	0	0	0	0	0	0	0	0	0	0	0

Palmerton Periphyton 2007 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-1	5053-37	5053-2	5053-38	5053-3	5053-39	5053-4	5053-40	5053-5	5053-41	5053-42	5053-43
	Cocconeis placentula var. *lineata*	3	11	0	4	5	17	8	59	25	73	33	164
	Cocconeis sp.	0	0	0	0	0	0	0	0	0	0	0	0
Cyclotella	*Cyclotella distinguenda*	0	0	0	0	0	0	0	0	0	0	0	0
	Cyclotella meneghiniana	0	3	1	0	3	2	1	2	5	6	1	0
	Cyclotella sp.	0	0	0	0	0	0	0	6	0	0	0	0
	Cyclotella stelligera	0	0	0	0	0	0	0	0	0	0	0	0
Cymatopleura	*Cymatopleura solea*	0	0	0	0	0	0	0	0	0	0	0	0
Cymbella	*Cymbella affinis*	0	2	1	0	0	6	0	2	0	8	2	2
	Cymbella aspera	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella cistula	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella cymbiformis	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella excisa	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella gracilis	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella lanceolata	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella lunata	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella mexicana	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella microcephala	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella minuta	19	33	13	65	29	68	10	29	4	18	10	7
	Cymbella minuta var. *latens*	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella minuta var. *silesiaca*	29	0	2	1	1	0	0	0	0	1	3	2
	Cymbella muelleri	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella sp.	0	0	0	0	0	2	0	0	0	0	0	0
	Cymbella subhelvetica	3	0	3	0	0	0	0	0	0	0	0	0
	Cymbella subturgidula	0	0	0	2	0	2	4	2	0	0	0	0
	Cymbella triangulum	0	0	0	0	0	0	0	1	2	0	0	0
	Cymbella tumida	2	1	0	0	1	1	0	0	2	0	0	0
Diatoma	*Diatoma anceps*	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma anceps var. *linearis*	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma hiemalis	0	1	0	0	0	0	0	0	0	0	0	0
	Diatoma mesdon	0	0	0	0	0	0	0	0	0	0	0	2
	Diatoma moniliformis	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma tenue var. *elongatum*	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma vulgaris	1	2	0	0	7	2	93	5	15	1	3	0
	Diatoma vulgaris var. *brevis*	0	0	0	0	0	0	0	0	0	0	0	0
Diploneis	*Diploneis elliptica*	0	0	0	0	0	0	0	0	0	0	0	0
Epithemia	*Epithemia turgida*	0	0	0	0	0	0	0	0	0	0	0	0
Eunotia	*Eunotia arcus*	0	0	0	0	2	0	0	0	0	0	0	0
	Eunotia curvata	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia incisa	0	0	0	0	0	0	0	0	0	1	0	0

Palmerton Periphyton 2007 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-1	5053-37	5053-2	5053-38	5053-3	5053-39	5053-4	5053-40	5053-5	5053-41	5053-42	5053-43
	Eunotia maior	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia pectinalis	1	0	0	0	0	0	0	0	0	0	0	0
	Eunotia pectinalis var. *minor*	0	0	0	0	0	0	0	0	0	0	0	1
	Eunotia praerupta	0	0	0	0	0	0	0	0	0	0	1	0
	Eunotia serra var. *diadema*	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia vanheurckii	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia vanheurckii var. *intermedia*	0	0	0	0	0	0	0	0	0	0	0	0
Fragilaria	*Fragilaria brevistriata* var. *inflata*	0	0	0	4	0	4	5	0	20	0	2	4
	Fragilaria capucina	0	140	0	80	79	34	5	12	32	0	2	0
	Fragilaria capucina var. *mesolepta*	0	0	0	0	2	0	0	0	0	0	0	0
	Fragilaria construens	3	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria construens var. *venter*	0	2	0	1	2	5	0	3	0	0	6	0
	Fragilaria crotonensis	37	0	91	0	31	0	17	0	4	0	0	0
	Fragilaria leptostauron	0	0	0	2	0	4	0	1	0	0	2	2
	Fragilaria leptostauron var. *dubia*	0	0	0	0	0	4	0	0	0	0	2	0
	Fragilaria pinnata	0	1	0	0	0	0	0	0	0	0	0	0
	Fragilaria sp.	0	0	0	0	0	0	0	0	0	0	0	8
	Fragilaria vaucheriae	8	5	1	0	5	5	2	3	14	0	2	16
	Fragilaria vaucheriae var. *capitellata*	0	6	0	15	24	29	15	31	10	5	0	2
	Fragilaria virescens	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria virescens var. *capitata*	0	0	0	9	0	0	0	0	0	0	0	0
Frustulia	*Frustulia rhomboides*	0	0	0	0	0	0	0	0	1	0	2	0
	Frustulia rhomboides var. *capitata*	0	0	0	0	0	0	0	0	0	0	0	0
	Frustulia vulgaris	0	0	0	0	1	0	0	0	0	0	0	0
	Frustulia vulgaris var. *capitata*	0	0	0	0	0	0	0	0	0	0	0	0
Gomphonema	*Gomphonema abbreviatum*	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema acuminatum	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema affine	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema augur var. *turris*	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema gracile	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema intricatum	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema minutum	0	0	0	3	0	0	0	0	0	0	0	0
	Gomphonema parvulum	3	1	4	8	1	5	5	12	3	23	0	0
	Gomphonema parvulum var. *saprophilum*	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema sp.	0	2	0	2	2	2	0	0	0	0	0	0
	Gomphonema sphaerophorum	0	0	0	0	0	0	0	0	0	2	0	0
	Gomphonema subclavatum var. *mexicanum*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrosigma	*Gyrosigma acuminatum*	0	0	0	0	0	0	0	0	0	0	0	0

Palmerton Periphyton 2007 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-1	5053-37	5053-2	5053-38	5053-3	5053-39	5053-4	5053-40	5053-5	5053-41	5053-42	5053-43
Hannaea	*Hannaea arcus*	0	0	0	0	0	0	0	0	0	0	0	0
Hantzschia	*Hantzschia amphioxys*	0	1	0	0	0	0	0	0	0	0	0	0
Melosira	*Melosira ambigua*	0	0	0	0	1	0	0	0	0	0	0	0
	Melosira varians	0	4	0	0	13	8	11	45	122	52	17	2
Meridion	*Meridion circulare*	0	0	0	1	0	0	0	0	0	0	0	0
	Meridion circulare var. *constrictum*	0	0	0	0	0	0	0	0	0	0	0	0
Navicula	*Navicula amphiceropsis*	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula angusta	0	0	0	0	0	0	0	0	0	0	0	2
	Navicula arvensis	0	0	0	0	0	0	0	0	0	0	2	0
	Navicula atomus	0	0	0	1	0	1	0	0	0	0	0	0
	Navicula bacillum	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula capitata	0	0	0	0	0	1	0	0	0	0	2	0
	Navicula cincta	0	1	0	0	0	0	0	0	0	0	0	0
	Navicula cocconeiformis	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula contenta	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula cryptocephala	0	4	0	6	9	14	3	11	11	5	10	4
	Navicula cuspidata	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula decussis	0	1	0	0	0	0	0	2	0	0	2	0
	Navicula gregaria	0	0	0	0	3	0	0	2	0	0	8	2
	Navicula halophila	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula laevissima	0	0	0	0	0	0	0	0	0	0	0	2
	Navicula meniculus var. *obtusa*	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula menisculus	0	0	0	0	0	3	0	0	5	2	2	0
	Navicula menisculus var. *upsaliensis*	0	0	0	0	0	2	0	0	0	0	2	0
	Navicula mutica	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula notha	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula pelliculosa	0	0	0	0	0	0	0	0	0	2	0	0
	Navicula peregrina	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula phyllepta	0	0	0	0	0	0	0	0	1	0	0	0
	Navicula phylleptosoma	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula protracta	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula pseudoscutiformis	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula pupula	0	0	0	0	0	0	0	0	0	0	0	4
	Navicula radiosa	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula radiosa var. *parva*	0	0	0	0	0	0	0	2	3	0	0	0
	Navicula radiosa var. *tenella*	2	5	0	5	6	22	3	16	13	4	20	12
	Navicula rhynchocephala	0	0	0	0	0	0	0	0	2	1	0	0
	Navicula rhynchocephala var. *germainii*	2	0	0	0	0	2	1	1	0	1	7	13

Palmerton Periphyton 2007 Aquashicola Creek Taxa
Diatom Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-1	5053-37	5053-2	5053-38	5053-3	5053-39	5053-4	5053-40	5053-5	5053-41	5053-42	5053-43
	Navicula sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula subminuscula	0	0	0	0	0	0	0	0	0	0	2	0
	Navicula submolesta	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula symmetrica	0	0	0	0	0	0	0	0	1	0	2	0
	Navicula tripunctata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula trivialis	0	0	0	0	0	0	1	0	2	0	1	1
	Navicula veneta	0	0	0	0	0	4	0	1	1	0	0	2
	Navicula vilaplanii	0	0	0	0	0	1	0	0	1	0	0	0
	Navicula viridula	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula viridula var. *avenacea*	0	0	0	1	0	1	1	2	0	0	2	6
	Navicula viridula var. *linearis*	0	0	0	0	0	0	0	0	0	0	4	0
	Navicula viridula var. *rostellata*	0	0	0	0	0	3	0	3	0	8	41	9
Neidium	*Neidium hercynicum*	0	0	0	0	2	0	0	0	0	0	0	0
	Neidium sp.	0	0	0	2	0	0	0	0	0	0	0	0
Nitzschia	*Nitzschia abridia*	0	0	0	0	0	0	0	0	0	0	47	0
	Nitzschia acicularis	0	0	0	0	3	2	0	0	0	0	0	0
	Nitzschia amphibia	4	0	0	3	1	0	0	0	0	0	6	1
	Nitzschia amphibioides	0	0	0	0	0	2	0	0	0	0	0	0
	Nitzschia angustata	0	0	0	0	0	0	0	0	0	0	2	0
	Nitzschia capitellata	9	3	0	0	1	1	3	4	2	6	2	2
	Nitzschia clausii	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia communis	0	0	0	0	0	0	0	0	0	0	2	0
	Nitzschia dissipata	0	4	0	0	11	13	4	8	8	3	23	2
	Nitzschia filiformis	0	0	0	0	0	1	0	0	1	0	0	0
	Nitzschia fonticola	3	0	3	0	6	0	7	2	8	3	5	2
	Nitzschia frustulum	0	0	0	0	0	6	0	1	0	0	0	0
	Nitzschia frustulum var. *perminuta*	0	0	0	0	0	4	0	0	0	2	3	2
	Nitzschia graciliformis	0	1	0	1	0	0	0	2	0	1	1	0
	Nitzschia gracilis	0	1	0	0	4	2	1	4	0	0	2	0
	Nitzschia heufleriana	0	0	0	0	0	0	0	0	1	0	0	0
	Nitzschia inconspicua	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia intermedia	2	0	1	0	5	0	0	0	8	0	0	0
	Nitzschia lancettula	0	0	0	0	0	5	0	2	1	0	1	2
	Nitzschia linearis	2	0	0	3	1	1	0	1	1	0	6	5
	Nitzschia microcephala	0	0	0	0	0	0	0	0	1	0	0	2
	Nitzschia palea	0	8	0	5	8	19	7	28	13	5	6	8
	Nitzschia palea var. *debilis*	0	2	0	0	0	2	0	0	0	0	3	4
	Nitzschia pura	0	0	0	0	0	2	0	0	0	0	0	0
	Nitzschia pusilla	0	0	0	0	0	0	0	0	0	0	2	1
	Nitzschia rosenstockii	0	0	0	0	0	0	0	0	0	0	0	0

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Diatom Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-1	5053-37	5053-2	5053-38	5053-3	5053-39	5053-4	5053-40	5053-5	5053-41	5053-42	5053-43
	Nitzschia sigma	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia sinuata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia sociabilis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia sp.	0	3	0	4	5	0	25	26	40	16	0	18
	Nitzschia subinflata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia umbonata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Pinnularia	*Pinnularia abaujensis* var. *linearis*	2	0	0	0	0	0	0	0	0	0	0	0
	Pinnularia biceps var. *pusilla*	0	0	0	0	0	0	0	1	0	0	0	0
	Pinnularia mesolepta	0	0	0	0	0	0	0	0	0	0	0	0
	Pinnularia microstauron	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pinnularia sp.	0	2	0	0	0	0	0	2	0	0	0	3
	Pinnularia subcapitata	4	0	0	0	0	0	0	0	0	0	0	0
Planothidium	*Planothidium frequentissimum*	4	16	0	2	6	13	0	10	22	0	20	27
Reimeria	*Reimeria sinuata*	3	0	1	4	2	2	2	3	0	2	4	16
Rhoicosphenia	*Rhoicosphenia curvata*	0	2	0	0	0	0	1	7	1	2	4	7
Stauroneis	*Stauroneis anceps* f. *linearis*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stauroneis smithii	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stauroneis tackei	8	4	3	8	0	17	0	2	0	1	0	1
Stenopterobia	*Stenopterobia delicatissima*	0	0	0	0	0	0	0	0	0	0	0	0
Surirella	*Surirella angusta*	6	8	1	5	20	5	0	0	0	0	0	0
	Surirella brebissonii	2	0	0	0	0	0	0	0	0	0	0	0
	Surirella linearis var. *helvetica*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Surirella ovalis	14	0	1	0	0	0	0	0	0	0	0	0
	Surirella ovata	3	10	1	12	0	0	0	0	0	0	0	0
	Surirella ovata var. *crumena*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Surirella ovata var. *pinnata*	0	0	0	0	0	0	0	0	0	0	0	0
	Surirella tenera	0	0	0	0	0	0	0	0	1	0	0	0
Synedra	*Synedra acus*	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra incisa	0	1	4	0	0	1	0	0	0	0	0	0
	Synedra parasitica	0	0	0	0	0	0	0	1	0	0	0	0
	Synedra pulchella	0	0	0	0	0	3	0	0	0	0	0	0
	Synedra rumpens	0	0	0	0	5	0	0	0	1	0	0	0
	Synedra rumpens var. *familiaris*	0	0	0	0	0	0	0	0	0	0	1	0
	Synedra rumpens var. *fragilarioides*	0	29	0	45	0	19	0	2	0	8	0	0
	Synedra rumpens var. *meneghiniana*	0	0	0	0	0	1	0	0	0	0	0	0
	Synedra sp.	0	2	0	0	6	0	0	0	0	0	0	0
	Synedra tenera	0	1	5	0	2	0	0	0	0	0	0	0
	Synedra ulna	12	6	2	9	9	5	1	11	5	2	0	1
	Synedra ulna var. *chaseana*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

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Diatom Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer	Diatometer
	Collection Date	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-1	5053-37	5053-2	5053-38	5053-3	5053-39	5053-4	5053-40	5053-5	5053-41	5053-42	5053-43
	Synedra ulna var. *contracta*	0	2	0	2	7	7	5	1	6	2	2	0
Tabellaria	*Tabellaria fenestrata*	0	0	0	0	0	0	0	0	0	0	0	0
	Tabellaria flocculosa	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**

Palmerton Periphyton 2007 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
Abundance Measures												
Species Richness	49.00	33.00	38.00	22.00	65.00	51.00	55.00	32.00	41.00	48.00	63.00	50.00
Number of Valves Counted	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Total Cells Counted	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Dominance Measures												
Dominant Taxon	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Cocconeis placentula* var. *lineata*
Dominant Taxon Abundance	233.00	395.00	269.00	456.00	135.00	241.00	193.00	350.00	290.00	164.00	191.00	164.00
2nd Dominant Taxon	*Fragilaria capucina*	*Fragilaria crotonensis*	*Fragilaria capucina*	*Fragilaria crotonensis*	*Cymbella minuta*	*Fragilaria capucina*	*Cocconeis placentula* var. *lineata*	*Diatoma vulgaris*	*Cocconeis placentula* var. *lineata*	*Melosira varians*	*Nitzschia abridia*	*Achnanthes minutissima*
2nd Dominant Taxon Abundance	140.00	37.00	80.00	91.00	68.00	79.00	59.00	93.00	73.00	122.00	47.00	155.00
3rd Dominant Taxon	*Cymbella minuta*	*Cymbella minuta* var. *silesiaca*	*Cymbella minuta*	*Cymbella minuta*	*Fragilaria capucina*	*Fragilaria crotonensis*	*Melosira varians*	*Nitzschia* sp.	*Melosira varians*	*Nitzschia* sp.	*Navicula viridula* var. *rostellata*	*Cocconeis placentula* var. *euglypta*
3rd Dominant Taxon Abundance	33.00	29.00	65.00	13.00	34.00	31.00	45.00	25.00	52.00	40.00	41.00	34.00
4th Dominant Taxon	*Synedra rumpens* var. *fragilarioides*	*Cymbella minuta*	*Synedra rumpens* var. *fragilarioides*	*Synedra tenera*	*Fragilaria vaucheriae* var. *capitellata*	*Cymbella minuta*	*Fragilaria vaucheriae* var. *capitellata*	*Fragilaria crotonensis*	*Gomphonema parvulum*	*Fragilaria capucina*	*Cocconeis placentula* var. *lineata*	*Planothidium frequentissimum*
4th Dominant Taxon Abundance	29.00	19.00	45.00	5.00	29.00	29.00	31.00	17.00	23.00	32.00	33.00	27.00
5th Dominant Taxon	*Planothidium frequentissimum*	*Surirella ovalis*	*Fragilaria vaucheriae* var. *capitellata*	*Gomphonema parvulum*	*Navicula radiosa* var. *tenella*	*Fragilaria vaucheriae* var. *capitellata*	*Cymbella minuta*	*Fragilaria vaucheriae* var. *capitellata*	*Cymbella minuta*	*Cocconeis placentula* var. *lineata*	*Achnanthes lanceolata* var. *dubia*	*Nitzschia* sp.
5th Dominant Taxon Abundance	16.00	14.00	15.00	4.00	22.00	24.00	29.00	15.00	18.00	25.00	27.00	18.00
% Dominant Taxon	38.83	65.83	44.83	76.00	22.50	40.17	32.17	58.33	48.33	27.33	31.83	27.33
% 2nd Dominant Taxon	23.33	6.17	13.33	15.17	11.33	13.17	9.83	15.50	12.17	20.33	7.83	25.83
% 3rd Dominant Taxon	5.50	4.83	10.83	2.17	5.67	5.17	7.50	4.17	8.67	6.67	6.83	5.67
% 4th Dominant Taxon	4.83	3.17	7.50	0.83	4.83	4.83	5.17	2.83	3.83	5.33	5.50	4.50
% 5th Dominant Taxon	2.67	2.33	2.50	0.67	3.67	4.00	4.83	2.50	3.00	4.17	4.50	3.00
Diversity/Evenness Measures												
Shannon-Weaver H' (log e)	2.33	1.65	2.17	0.94	3.29	2.57	2.84	1.73	2.17	2.71	3.00	2.65
Shannon-Weaver H' (log 10)	1.01	0.72	0.94	0.41	1.43	1.12	1.23	0.75	0.94	1.18	1.30	1.15
Shannon-Weaver H' (log 2)	3.36	2.38	3.13	1.36	4.75	3.71	4.10	2.49	3.13	3.91	4.32	3.82
Margalef's Richness	7.50	5.00	5.78	3.28	10.00	7.82	8.44	4.85	6.25	7.35	9.69	7.66
Van Dam Indices												
Van Dam pH	3.10	3.16	3.06	3.16	3.32	3.26	3.37	3.45	3.35	3.54	3.48	3.59
Van Dam Salinity	1.97	2.06	1.98	2.00	2.03	2.01	2.02	2.01	2.01	2.04	2.11	1.99
Van Dam Nitrogen Uptake	2.01	2.00	2.04	2.00	2.14	2.09	2.27	2.05	2.15	2.32	2.06	2.02

Palmerton Periphyton 2007 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Diatometer**
Collection Date	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-01-2007**	**08-16-2007**	**08-16-2007**
EcoAnalysts Sample ID	**5053-37**	**5053-1**	**5053-38**	**5053-2**	**5053-39**	**5053-3**	**5053-40**	**5053-4**	**5053-41**	**5053-5**	**5053-42**	**5053-43**
Van Dam Oxygen Tolerance	1.34	1.27	1.24	1.20	1.88	1.54	2.02	1.41	1.84	2.08	1.67	2.11
Van Dam Saprobity	2.05	2.05	2.09	2.01	2.24	2.12	2.39	2.08	2.25	2.38	2.21	2.03
Van Dam Trophic State	5.29	6.40	5.91	6.26	5.48	5.48	5.83	6.07	6.08	5.62	5.56	5.51
Van Dam Moisture	2.85	2.79	2.93	2.65	2.58	2.60	2.58	2.49	2.64	2.37	2.63	2.44
pH Preference												
% at Optimal Occurance pH 5.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Mainly Occuring at pH<7	1.01	0.97	0.00	0.86	0.00	0.77	0.00	0.00	0.19	0.21	0.66	0.61
% Mainly Occuring at pH~7	88.87	82.75	93.63	82.24	68.44	74.90	64.07	71.90	65.49	49.79	53.39	41.92
% Mainly Occuring at pH>7	9.72	15.70	6.37	16.90	31.11	21.81	34.85	10.72	33.96	46.03	43.33	55.21
% Exclusively Occuring at pH>7	0.40	0.58	0.00	0.00	0.44	2.51	1.08	17.38	0.37	3.97	2.63	2.25
% at no Apparent Optimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified pH	17.67	14.00	18.83	3.33	25.00	13.67	23.00	9.83	10.67	20.33	23.83	18.50
Richness at pH <5.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Richness at pH <7	2.00	2.00	0.00	1.00	0.00	2.00	0.00	0.00	1.00	1.00	2.00	2.00
Richness at pH ~7	11.00	6.00	11.00	6.00	13.00	11.00	11.00	9.00	8.00	9.00	13.00	11.00
Richness at pH >7	16.00	12.00	13.00	6.00	30.00	21.00	23.00	12.00	17.00	21.00	31.00	21.00
Richness Exclusively at pH >7	1.00	2.00	0.00	0.00	1.00	3.00	1.00	2.00	2.00	2.00	3.00	1.00
Richness at no Optimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salinity Preference												
% Fresh	3.86	0.19	2.64	0.86	2.84	1.57	1.30	0.19	0.56	0.42	2.62	4.51
% Fresh-Brackish	95.53	96.34	97.15	98.80	91.68	96.47	95.45	99.25	98.31	96.44	84.31	93.24
% Brackish-Fresh	0.61	0.39	0.00	0.17	5.03	1.18	2.81	0.37	1.13	1.89	12.27	1.02
% Brackish	0.00	3.08	0.20	0.17	0.44	0.78	0.43	0.19	0.00	1.26	0.80	1.23
% Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Salinity	18.00	13.50	18.00	3.17	23.83	15.00	23.00	10.83	11.33	20.50	17.17	18.67
Richness Fresh	6.00	1.00	2.00	1.00	4.00	3.00	3.00	1.00	2.00	2.00	6.00	6.00
Richness Fresh-Brackish	23.00	18.00	21.00	10.00	35.00	30.00	26.00	18.00	26.00	24.00	35.00	25.00
Richness Brackish-Fresh	1.00	1.00	0.00	1.00	4.00	2.00	5.00	2.00	1.00	4.00	6.00	3.00
Richness Brackish	0.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	0.00	3.00	2.00	1.00
Richness Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Uptake Metabolism												
% Very Small Tolerance N	6.43	1.03	3.10	1.06	8.72	1.31	1.97	0.97	2.57	5.71	5.06	3.51
% Elevated Tolerance N	88.42	97.53	91.64	98.05	77.57	91.12	76.35	94.39	80.40	59.76	86.75	93.64
% Needing Periodically Elevated N	2.57	1.44	3.41	0.89	4.98	4.70	14.53	3.29	16.04	31.19	5.78	0.66

Palmerton Periphyton 2007 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
% Needing Continuously Elevated N	2.57	0.00	1.86	0.00	8.72	2.87	7.14	1.35	0.99	3.33	2.41	2.19
% Unclassified Nitrogen	48.17	19.00	46.17	6.00	46.50	36.17	32.33	13.83	15.83	30.00	30.83	24.00
Richness at Small Tolerance N	7.00	2.00	3.00	2.00	7.00	3.00	6.00	1.00	4.00	4.00	10.00	7.00
Richness at Elevated Tolerance N	13.00	13.00	9.00	6.00	20.00	19.00	17.00	12.00	14.00	14.00	21.00	17.00
Richness at Periodic Elevated N	3.00	2.00	2.00	2.00	4.00	4.00	3.00	3.00	3.00	4.00	3.00	2.00
Richness at Continuously Elevated N	1.00	0.00	2.00	0.00	4.00	2.00	2.00	1.00	1.00	2.00	3.00	2.00
Oxygen Requirements												
% at Continuously High Oxygen	81.99	83.13	87.93	82.09	54.49	64.94	50.25	68.92	60.40	44.55	58.41	41.01
% at Fairly High Oxygen	6.43	10.49	4.02	16.84	15.17	21.82	8.82	24.13	3.17	9.95	20.26	9.87
% at Moderate Oxygen	7.72	2.88	4.02	0.00	19.20	8.57	29.90	4.44	29.50	39.81	17.67	46.49
% at Low Oxygen	2.89	3.50	4.02	0.89	10.53	3.90	10.54	2.32	5.74	4.50	3.45	2.63
% at Very Low Oxygen	0.96	0.00	0.00	0.18	0.62	0.78	0.49	0.19	1.19	1.18	0.22	0.00
% Unclassified Oxygen	48.17	19.00	46.17	6.00	46.17	35.83	32.00	13.67	15.83	29.67	22.67	24.00
Richness at High Oxygen	9.00	5.00	6.00	4.00	11.00	7.00	8.00	3.00	6.00	5.00	15.00	9.00
Richness at Fairly High Oxygen	6.00	6.00	5.00	3.00	11.00	9.00	9.00	8.00	5.00	8.00	10.00	8.00
Richness at Moderate Oxygen	6.00	4.00	3.00	0.00	8.00	7.00	6.00	4.00	7.00	8.00	10.00	8.00
Richness at Low Oxygen	2.00	2.00	2.00	2.00	5.00	4.00	4.00	2.00	3.00	4.00	3.00	3.00
Richness at Very Low Oxygen	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Saprobity												
% Very Slightly Polluted	4.40	0.41	1.47	0.88	7.16	1.06	1.18	0.96	0.99	5.18	4.43	6.36
% Moderately Polluted	90.33	95.29	92.87	98.05	75.21	89.81	75.00	93.69	80.24	59.18	73.63	88.14
% Moderate-Heavily Polluted	2.64	3.69	2.21	0.18	9.09	6.58	13.68	2.87	12.06	30.89	19.62	3.39
% Heavily Polluted	0.88	0.61	2.21	0.88	3.31	0.85	3.54	1.15	5.73	1.94	1.05	0.42
% Very Heavily Polluted	1.76	0.00	1.23	0.00	5.23	1.70	6.60	1.34	0.99	2.81	1.27	1.69
% Unclassified Saprobity	24.17	18.67	32.17	5.83	39.50	21.50	29.33	12.83	15.67	22.83	21.00	21.33
Richness Very Slightly Polluted	7.00	1.00	2.00	1.00	8.00	3.00	4.00	1.00	3.00	4.00	9.00	9.00
Richness Moderately Polluted	13.00	14.00	12.00	7.00	20.00	19.00	20.00	12.00	13.00	14.00	23.00	13.00
Richness Moderate-Heavily Polluted	5.00	2.00	2.00	1.00	7.00	6.00	3.00	3.00	4.00	7.00	8.00	7.00
Richness Heavily Polluted	2.00	1.00	2.00	2.00	4.00	2.00	3.00	2.00	2.00	3.00	3.00	1.00
Richness Very Heavily	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Palmerton Periphyton 2007 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
Polluted												
Trophic State												
% Oligotrophic	2.64	0.00	0.98	0.00	3.02	0.42	0.46	0.19	0.78	0.21	3.53	1.28
% Oligo-Mesotrophic	1.10	0.82	0.00	0.88	1.10	0.85	0.00	0.00	0.78	0.00	0.83	0.43
% Mesotrophic	31.06	8.40	20.98	16.28	11.54	24.52	5.57	4.76	0.98	8.78	2.08	4.70
% Meso-Eutrophic	2.20	2.25	1.46	0.53	7.97	6.34	5.34	20.00	1.37	7.28	10.19	4.49
% Eutrophic	8.59	7.58	6.83	1.59	26.10	13.32	34.80	5.52	37.30	38.54	39.50	52.35
% Hypereutrophic	1.76	0.00	1.46	0.00	6.59	1.69	6.50	1.33	0.98	2.78	1.25	1.71
% Oligo-to-Eutrophic	52.64	80.94	68.29	80.71	43.68	52.85	47.33	68.19	57.81	42.40	42.62	35.04
% Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Trophic	24.33	18.67	31.67	5.83	39.33	21.17	28.17	12.50	14.67	22.17	19.83	22.00
Richness Oligotrophic	2.00	0.00	1.00	0.00	3.00	1.00	2.00	1.00	3.00	1.00	5.00	2.00
Richness Oligo-Mesotrophic	2.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	2.00	0.00	2.00	1.00
Richness Mesotrophic	2.00	3.00	3.00	2.00	4.00	4.00	4.00	4.00	2.00	3.00	4.00	4.00
Richness Meso-Eutrophic	5.00	5.00	3.00	1.00	8.00	8.00	8.00	4.00	3.00	5.00	8.00	6.00
Richness Eutrophic	11.00	8.00	8.00	6.00	17.00	14.00	16.00	8.00	12.00	14.00	21.00	13.00
Richness Hypereutrophic	1.00	0.00	2.00	0.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Richness Oligo-to-Eutrophic	4.00	1.00	4.00	1.00	4.00	2.00	2.00	3.00	3.00	5.00	4.00	4.00
Richness Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moisture												
% Never Outside Water	3.18	9.84	0.62	16.81	9.09	15.56	5.34	22.93	0.79	9.30	5.07	2.14
% Mainly in Water, Sometimes Wet	8.92	1.64	6.17	1.24	23.94	8.67	31.80	5.59	34.06	44.42	27.70	52.25
% Mainly in Water, Regularly Wet	87.26	88.52	92.90	81.95	66.67	75.51	62.86	71.48	65.15	46.28	66.38	45.40
% Mainly Wet, Moist or Temporarily Dry	0.64	0.00	0.31	0.00	0.30	0.26	0.00	0.00	0.00	0.00	0.85	0.21
% Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Moisture	47.67	18.67	46.00	5.83	45.00	34.67	31.33	13.50	15.83	28.33	21.17	22.17
Richness Never Outside Water	5.00	6.00	2.00	3.00	9.00	10.00	6.00	5.00	2.00	8.00	7.00	3.00
Richness Mainly in Water, Sometimes Wet	8.00	3.00	5.00	3.00	12.00	6.00	11.00	6.00	12.00	8.00	15.00	13.00
Richness Mainly in Water, Regularly Wet	11.00	9.00	9.00	5.00	17.00	13.00	13.00	8.00	8.00	11.00	19.00	14.00
Richness Mainly Wet, Moist or Temporarily Dry	2.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	2.00	1.00
Richness Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2007 Aquashicola Creek Metrics

Diatom Metrics

Site	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
Morphological Guild (JS)												
% Erect	0.00	0.19	0.21	0.00	0.00	0.40	0.00	0.00	0.23	0.00	0.30	0.00
% Stalked	7.77	4.67	16.24	3.12	20.15	6.24	11.03	2.87	11.14	2.10	3.64	3.80
% Unattached	2.10	0.19	0.00	0.17	2.95	4.63	13.33	20.08	13.41	33.18	6.36	1.69
% Prostrate/Adnate	60.50	87.16	66.03	80.94	67.57	66.60	72.31	72.85	75.23	56.31	88.48	93.67
% Variable	29.62	7.78	17.52	15.77	9.34	22.13	3.33	4.21	0.00	8.41	1.21	0.84
% Unclassified Morphological Guild	20.67	14.33	22.00	3.83	32.17	17.17	35.00	12.83	26.67	28.67	45.00	60.50
Richness Erect	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00
Richness Stalked	4.00	3.00	3.00	3.00	5.00	3.00	3.00	2.00	3.00	3.00	2.00	2.00
Richness Unattached	4.00	1.00	0.00	1.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00
Richness Prostrate/Adnate	15.00	12.00	12.00	7.00	24.00	19.00	20.00	10.00	16.00	21.00	24.00	21.00
Richness Variable	2.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	1.00
Motility (JS)												
% Highly Motile	4.43	6.23	3.15	1.01	11.75	11.05	10.41	3.47	2.96	9.33	25.24	8.30
% Moderately Motile	2.70	3.58	4.27	0.67	10.93	3.93	7.01	1.65	2.96	7.11	12.26	21.66
% Not Motile	85.93	85.47	80.15	95.45	61.03	79.03	74.89	92.32	88.37	81.78	59.37	66.43
% Variable Motility	6.94	4.72	12.43	2.86	16.29	5.99	7.69	2.56	5.71	1.78	3.13	3.61
% Unclassified Motility	13.50	11.67	10.17	1.00	19.17	11.00	26.33	8.83	21.17	25.00	30.67	53.83
Richness Highly Motile	6.00	7.00	5.00	4.00	11.00	9.00	7.00	4.00	5.00	9.00	12.00	8.00
Richness Moderately Motile	5.00	5.00	6.00	2.00	11.00	7.00	10.00	6.00	7.00	11.00	15.00	12.00
Richness Not Motile	17.00	9.00	11.00	9.00	19.00	17.00	17.00	11.00	15.00	13.00	13.00	9.00
Richness Variable Motility	3.00	4.00	2.00	3.00	5.00	3.00	4.00	2.00	3.00	3.00	3.00	3.00
Pollution Tolerance (LB)												
% Very Tolerant	23.50	0.33	14.00	0.00	6.00	13.33	2.17	0.83	0.00	5.50	2.00	0.83
% Moderately Tolerant	9.00	8.00	12.17	16.67	18.17	15.83	17.17	8.50	13.50	27.50	12.00	5.00
% Sensitive/Intolerant	50.83	76.17	60.33	80.83	45.67	53.50	43.33	62.17	57.50	33.00	50.67	35.50
Richness Very Tolerant	2.00	1.00	3.00	0.00	3.00	2.00	2.00	1.00	0.00	2.00	4.00	1.00
Richness Moderately Tolerant	8.00	4.00	6.00	4.00	12.00	11.00	12.00	8.00	9.00	15.00	13.00	12.00
Richness Sensitive/Intolerant	15.00	12.00	10.00	11.00	19.00	14.00	15.00	9.00	13.00	10.00	18.00	12.00
Pollution Tolerance (Lang-Bertalot modified by Bohls)	2.33	2.90	2.54	2.83	2.57	2.49	2.66	2.86	2.81	2.42	2.75	2.84
Other Measures												
% Rhopalodiales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	38.83	65.83	44.83	76.00	22.50	40.17	32.17	58.33	48.33	27.33	31.83	25.83
% Siltation Index	8.50	8.17	7.67	1.17	19.00	13.83	19.33	9.33	9.83	20.67	36.17	17.33

Palmerton Periphyton 2007 Aquashicola Creek Metrics

Diatom Metrics

Site	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**ACO7**	**AC08**
Device	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Rock Scrape**	**Diatometer**	**Diatometer**
Collection Date	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-02-2007**	**08-16-2007**	**08-01-2007**	**08-16-2007**	**08-16-2007**
EcoAnalysts Sample ID	**5053-37**	**5053-1**	**5053-38**	**5053-2**	**5053-39**	**5053-3**	**5053-40**	**5053-4**	**5053-41**	**5053-5**	**5053-42**	**5053-43**
Siltation Richness	13.00	11.00	11.00	5.00	24.00	14.00	18.00	11.00	14.00	21.00	29.00	22.00
% Aerophiles	77.33	84.00	78.17	95.50	68.00	83.83	69.50	89.83	74.17	72.83	62.17	40.17
% Centrics	1.17	0.00	0.00	0.17	1.67	2.83	8.83	2.00	9.67	21.17	3.00	0.33
% Stability Index	33.00	10.17	27.83	17.17	20.50	29.83	11.67	23.83	3.00	17.83	3.67	5.83
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2007 Aquashicola Creek Taxa
Soft Body Algae Identifications

	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
	Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
	Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
	EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
DIATOMS	*Achnanthes* sp.	104	0	16	66	51	100	28	52	73	111	81	84
	Amphora sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Brachysira sp.	0	0	0	0	0	0	2	0	0	0	0	0
	Caloneis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Cocconeis sp.	2	0	8	0	4	1	153	1	74	3	15	51
	Cyclotella sp.	0	0	0	0	0	0	4	0	0	0	0	4
	Cymatopleura sp.	0	0	0	0	0	0	0	0	0	0	0	2
	Cymbella sp.	5	1	12	1	14	3	4	2	3	0	16	4
	Diatoma sp.	0	0	0	0	2	0	6	34	0	15	0	0
	Epithemia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eucocconeis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eunotia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Fragilaria sp.	22	0	50	10	6	77	3	12	5	25	6	5
	Frustulia sp.	0	0	1	0	0	0	0	0	0	0	0	2
	Gomphonema sp.	0	0	1	0	0	0	1	1	5	0	0	1
	Hannaea sp.	0	0	0	0	0	0	2	0	0	0	0	0
	Mastogloia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Melosira sp.	0	0	3	0	9	3	49	0	10	85	18	12
	Meridion sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula sp.	13	0	10	0	11	3	5	0	8	3	34	18
	Nitzschia sp.	9	0	3	0	4	1	14	1	3	0	10	3
	Pinnularia sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Reimeria sinuata	0	0	2	0	0	0	0	0	0	0	0	0
	Rhoicosphenia sp.	0	0	0	0	0	0	1	0	0	0	0	2
	Rhopalodia sp.	0	0	1	0	0	0	0	0	0	0	0	0
	Stauroneis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Surirella sp.	0	0	0	1	0	2	2	0	0	2	0	0
	Synedra sp.	36	2	39	3	16	1	11	4	10	2	13	9
	Tabellaria sp.	0	0	0	0	0	0	0	0	0	0	0	0
	DIATOM SUBTOTAL	**191**	**3**	**146**	**81**	**117**	**191**	**285**	**107**	**191**	**246**	**193**	**197**
SOFT BODY ALGAE	*Anabaena* sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Ankistrodesmus sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Aphanizomenon sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Botryococcus sp.	2	0	0	0	0	0	0	0	0	0	0	0
	Characiopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0
	Chlamydononas sp.	3	0	0	0	11	0	1	0	0	0	0	0
	Chlorella sp.	1	0	6	0	6	0	0	0	0	0	0	0
	Chroococcus sp.	1	0	0	0	0	0	0	0	0	0	0	0
	Cladophora sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Periphyton 2007 Aquashicola Creek Taxa
Soft Body Algae Identifications

Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
Closterium sp.	0	0	0	0	0	0	0	1	0	0	0	0
Coelastrum sp.	0	0	0	1	0	0	0	0	0	0	0	0
Cosmarium sp.	0	1	0	7	0	3	0	4	0	1	0	0
Dictyosphaerium sp.	0	0	0	0	0	0	0	0	0	0	0	0
Dinobryon sp.	0	0	0	2	0	0	0	0	0	0	0	0
Euglena sp.	3	0	2	0	0	0	0	0	0	0	0	2
Gloeocapsa sp.	0	29	1	0	0	0	0	0	0	0	0	0
Gongrosira sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
LGBs	50	57	69	0	71	0	0	0	56	19	47	47
Mallomonas sp.	1	0	0	0	0	0	0	0	0	0	0	0
Merismopedia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Microcystis sp.	43	25	36	31	55	0	8	45	47	33	25	42
Microspora sp.	0	33	0	0	0	0	0	0	0	0	0	0
Mougeotia sp.	0	0	0	28	0	56	0	15	0	0	0	0
Netrium sp.	0	0	0	0	0	0	0	0	0	0	0	0
Oedogonium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Oocystis sp.	3	49	17	9	16	8	0	5	6	0	18	7
Oscillatoria sp.	0	3	2	4	15	0	4	2	0	0	12	3
Pediastrum sp.	0	0	0	0	0	0	0	0	0	0	0	0
Phacus sp.	0	0	2	0	0	0	0	0	0	0	0	0
Phormidium sp.	0	22	1	0	0	0	0	0	0	0	0	0
Pleurotaenium sp.	0	0	0	0	0	0	0	0	0	0	0	0
Protoderma sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Raphidiopsis sp.	0	0	0	1	0	0	0	0	0	0	0	0
Rhizoclonium sp.	0	0	0	0	0	0	0	0	0	0	0	0
Roya sp.	0	0	1	0	0	0	0	0	0	0	0	0
Scendesmus sp.	2	78	15	2	4	4	1	2	0	0	5	0
Sphanerocystis sp.	0	0	0	8	0	0	0	111	0	0	0	2
Spirogyra sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Staurastrum sp.	0	0	0	0	0	0	0	0	0	1	0	0
Stichosiphon sp.	0	0	0	0	2	0	0	0	0	0	0	0
Stigeoclonium sp.	0	0	0	9	0	0	0	8	0	0	0	0
Synura sp.	0	0	0	0	0	0	0	0	0	0	0	0
Tetraedron	0	0	0	0	0	0	0	0	0	0	0	0
Ulothrix sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Volvox sp.	0	0	0	0	3	0	0	0	0	0	0	0
Zygnema sp.	0	0	2	117	0	38	1	0	0	0	0	0
SOFT BODY SUBTOTAL	**109**	**297**	**154**	**219**	**183**	**109**	**15**	**193**	**109**	**54**	**107**	**103**
GRAND TOTAL	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**

Palmerton Periphyton 2007 Aquashicola Creek Metrics
Soft Body Algae Metrics

Site	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
Abundance Measures												
Species Richness	17.00	11.00	24.00	17.00	18.00	14.00	20.00	17.00	12.00	12.00	13.00	19.00
Number of Valves Counted	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Total Cells Counted	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Dominance Measures												
Dominant Taxon	*Achnanthes* sp.	*Scenedesmus* sp.	LGBs	*Zygnema* sp.	LGBs	*Achnanthes* sp.	*Cocconeis* sp.	*Sphaerocystis* sp.	*Cocconeis* sp.	*Achnanthes* sp.	*Achnanthes* sp.	*Achnanthes* sp.
Dominant Taxon Abundance	104.00	78.00	69.00	117.00	71.00	100.00	153.00	111.00	74.00	111.00	81.00	84.00
2nd Dominant Taxon	*LGBs*	LGBs	*Fragilaria* sp.	*Achnanthes* sp.	*Microcystis* sp.	*Fragilaria* sp.	*Melosira* sp.	*Achnanthes* sp.	*Achnanthes* sp.	*Melosira* sp.	LGBs	*Cocconeis* sp.
2nd Dominant Taxon Abundance	50.00	57.00	50.00	66.00	55.00	77.00	49.00	52.00	73.00	85.00	47.00	51.00
3rd Dominant Taxon	*Microcystis* sp.	*Oocystis* sp.	*Synedra* sp.	*Microcystis* sp.	*Achnanthes* sp.	*Mougeotia* sp.	*Achnanthes* sp.	*Microcystis* sp.	LGBs	*Microcystis* sp.	*Navicula* sp.	LGBs
3rd Dominant Taxon Abundance	43.00	49.00	39.00	31.00	51.00	56.00	28.00	45.00	56.00	33.00	34.00	47.00
4th Dominant Taxon	*Synedra* sp.	*Microspora* sp.	*Microcystis* sp.	*Mougeotia* sp.	*Oocystis* sp.	*Zygnema* sp.	*Nitzschia* sp.	*Diatoma* sp.	*Microcystis* sp.	*Fragilaria* sp.	*Microcystis* sp.	*Microcystis* sp.
4th Dominant Taxon Abundance	36.00	33.00	36.00	28.00	16.00	38.00	14.00	34.00	47.00	25.00	25.00	42.00
5th Dominant Taxon	*Fragilaria* sp.	*Gloeocapsa* sp.	*Oocystis* sp.	*Fragilaria* sp.	*Synedra* sp.	*Oocystis* sp.	*Synedra* sp.	*Mougeotia* sp.	*Melosira* sp.	*LGBs*	*Melosira* sp.	*Navicula* sp.
5th Dominant Taxon Abundance	22.00	29.00	17.00	10.00	16.00	8.00	11.00	15.00	10.00	19.00	18.00	18.00
% Dominant Taxon	34.67	26.00	23.00	39.00	23.67	33.33	51.00	37.00	24.67	37.00	27.00	28.00
% 2nd Dominant Taxon	16.67	19.00	16.67	22.00	18.33	25.67	16.33	17.33	24.33	28.33	15.67	17.00
% 3rd Dominant Taxon	14.33	16.33	13.00	10.33	17.00	18.67	9.33	15.00	18.67	11.00	11.33	15.67
% 4th Dominant Taxon	12.00	11.00	12.00	9.33	5.33	12.67	4.67	11.33	15.67	8.33	8.33	14.00
% 5th Dominant Taxon	7.33	9.67	5.67	3.33	5.33	2.67	3.67	5.00	3.33	6.33	6.00	6.00
Diversity/Evenness Measures												
Shannon-Weaver H' (log e)	2.00	1.95	2.42	1.91	2.35	1.72	1.78	1.94	1.92	1.70	2.27	2.18
Shannon-Weaver H' (log 10)	0.87	0.85	1.05	0.83	1.02	0.75	0.77	0.84	0.84	0.74	0.98	0.94
Shannon-Weaver H' (log 2)	2.88	2.81	3.48	2.76	3.39	2.48	2.57	2.80	2.77	2.45	3.27	3.14
Margalef's Richness	2.81	1.75	4.03	2.81	2.98	2.28	3.33	2.81	1.93	1.93	2.10	3.16
Other Measures												
% Rhopalodiales	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Siltation Index	7.33	0.00	4.33	0.33	5.00	2.00	7.00	0.33	3.67	1.67	14.67	7.00
Siltation Richness	2.00	0.00	2.00	1.00	2.00	3.00	3.00	1.00	2.00	2.00	2.00	2.00
% Aerophiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Centrics	0.00	0.00	1.00	0.00	3.00	1.00	17.67	0.00	3.33	28.33	6.00	5.33
% Stability Index	19.33	0.67	29.67	4.33	8.00	26.00	7.33	16.67	5.00	14.00	6.33	4.67

Palmerton Periphyton 2007 Aquashicola Creek Metrics
Soft Body Algae Metrics

Site	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	ACO7	AC08
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Diatometer
Collection Date	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-02-2007	08-16-2007	08-01-2007	08-16-2007	08-16-2007
EcoAnalysts Sample ID	5053-37	5053-1	5053-38	5053-2	5053-39	5053-3	5053-40	5053-4	5053-41	5053-5	5053-42	5053-43
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2007 Lehigh River Taxa
Diatom Identifications

	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
Achnanthes	*Achnanthes biporoma*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes clevei	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes conspicua	2	0	2	0	2	0	0	0	0	0	0	0	0	0
	Achnanthes daonensis	0	0	0	0	0	0	3	0	1	0	0	0	0	0
	Achnanthes deflexa	0	2	0	4	0	7	0	1	0	1	0	0	0	1
	Achnanthes detha	0	0	0	0	0	1	5	0	0	0	0	0	0	2
	Achnanthes exigua	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes flexella	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes hauckiana	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Achnanthes hauckiana var. *rostrata*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes hungarica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes laevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes lanceolata	0	0	0	0	0	0	0	2	0	0	0	0	0	0
	Achnanthes lanceolata var. *apiculata*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Achnanthes lanceolata var. *dubia*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes linearis	0	2	2	46	0	7	2	2	2	2	2	0	0	1
	Achnanthes microcephala	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes minutissima	223	52	224	2	101	158	398	283	149	158	188	63	192	211
	Achnanthes peragalli	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes sp.	0	0	0	0	0	2	0	0	0	0	0	0	0	0
	Achnanthes stewartii	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Achnanthes subhudsonis	2	54	2	0	71	71	2	4	10	0	6	2	0	0
Amphora	*Amphora ovalis*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Amphora pediculus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Amphora perpusilla	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Amphora submontana	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Anomoeoneis	*Anomoeoneis brachysira*	0	0	0	0	2	0	0	2	2	0	0	0	6	2
	Anomoeoneis vitrea	0	0	0	0	0	0	0	0	1	3	0	0	0	3
Aulacoseira	*Aulacoseira granulata*	0	0	0	0	0	0	0	0	0	0	4	0	0	0
	Aulacoseira granulata var. *angustissima*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachysira	*Brachysira neoexilis*	0	0	0	0	0	2	0	0	0	6	0	2	4	0
Caloneis	*Caloneis bacillum*	0	0	0	8	0	0	0	0	0	0	0	0	0	0
Cocconeis	*Cocconeis neodiminuta*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cocconeis neothumensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cocconeis pediculus	0	0	0	0	0	0	0	0	2	0	4	0	0	0
	Cocconeis placentula	0	16	0	0	0	30	0	0	0	0	0	6	0	3
	Cocconeis placentula var. *euglypta*	0	24	0	68	0	4	0	1	0	0	0	35	0	14

Palmerton Periphyton 2007 Lehigh River Taxa
Diatom Identifications

	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
	Cocconeis placentula var. *intermedia*	0	0	0	0	0	0	0	0	0	326	0	0	0	0
	Cocconeis placentula var. *lineata*	14	104	5	16	244	63	10	34	188	0	132	264	215	193
	Cocconeis sp.	0	0	0	18	0	0	0	0	0	0	0	0	0	0
Cyclotella	*Cyclotella distinguenda*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cyclotella meneghiniana	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Cyclotella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cyclotella stelligera	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Cymatopleura	*Cymatopleura solea*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cymbella	*Cymbella affinis*	0	0	2	4	0	0	0	0	0	0	0	0	0	0
	Cymbella aspera	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Cymbella cistula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella cymbiformis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella excisa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella gracilis	0	0	0	0	0	0	0	0	2	0	0	0	2	0
	Cymbella lanceolata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella lunata	0	0	0	0	0	0	2	0	0	0	0	0	0	0
	Cymbella mexicana	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella microcephala	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella minuta	12	35	8	42	2	13	26	27	8	9	17	24	9	25
	Cymbella minuta var. *latens*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella minuta var. *silesiaca*	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	Cymbella muelleri	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella subhelvetica	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella subturgidula	0	0	10	0	0	0	0	0	0	0	0	0	0	0
	Cymbella triangulum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella tumida	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Diatoma	*Diatoma anceps*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma anceps var. *linearis*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma hiemalis	0	0	0	0	0	9	0	0	2	0	0	2	0	2
	Diatoma mesdon	0	1	2	0	0	0	0	0	0	2	0	0	2	0
	Diatoma moniliformis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma tenue var. *elongatum*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma sp.	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Diatoma vulgaris	0	0	0	2	0	1	0	0	0	0	0	2	0	0
	Diatoma vulgaris var. *brevis*	0	2	0	0	0	0	0	0	0	0	0	2	0	2
Diploneis	*Diploneis elliptica*	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Epithemia	*Epithemia turgida*	0	0	0	0	0	0	0	0	0	0	1	0	0	0

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	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
Eunotia	*Eunotia arcus*	0	0	0	0	0	0	0	0	0	0	0	2	0	3
	Eunotia curvata	0	0	0	0	0	0	0	4	0	0	0	2	0	1
	Eunotia incisa	0	0	0	0	0	0	0	2	0	1	0	2	0	4
	Eunotia maior	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia pectinalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia pectinalis var. *minor*	0	0	0	0	0	0	0	0	2	0	2	0	0	0
	Eunotia praerupta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia serra var. *diadema*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia vanheurckii	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eunotia vanheurckii var. *intermedia*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fragilaria	*Fragilaria brevistriata* var. *inflata*	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Fragilaria capucina	119	50	121	124	3	23	19	17	8	0	6	4	0	0
	Fragilaria capucina var. *mesolepta*	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	Fragilaria construens	0	0	0	0	0	0	4	5	0	0	0	0	0	0
	Fragilaria construens var. *venter*	0	0	0	0	2	0	0	4	0	0	0	0	0	0
	Fragilaria crotonensis	169	0	170	0	0	0	37	50	8	0	2	1	0	0
	Fragilaria leptostauron	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria leptostauron var. *dubia*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria pinnata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria sp.	0	0	0	0	0	0	0	0	0	24	0	0	0	0
	Fragilaria vaucheriae	2	2	2	2	4	1	0	4	1	3	6	0	0	7
	Fragilaria vaucheriae var. *capitellata*	0	0	0	0	0	0	2	14	0	0	0	0	0	0
	Fragilaria virescens	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragilaria virescens var. *capitata*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frustulia	*Frustulia rhomboides*	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	Frustulia rhomboides var. *capitata*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Frustulia vulgaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Frustulia vulgaris var. *capitata*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gomphonema	*Gomphonema abbreviatum*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema acuminatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema affine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema augur var. *turris*	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Gomphonema gracile	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema intricatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema minutum	0	0	0	124	0	0	0	0	0	0	0	0	0	0
	Gomphonema parvulum	4	1	2	20	0	7	0	2	11	1	6	12	5	7
	Gomphonema parvulum var. *saprophilum*	0	4	0	0	0	0	0	0	0	0	0	0	0	6
	Gomphonema sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
	Gomphonema sphaerophorum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema subclavatum var. *mexicanum*	2	0	2	0	11	0	0	0	0	0	0	0	0	0
Gyrosigma	*Gyrosigma acuminatum*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Hannaea	*Hannaea arcus*	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Hantzschia	*Hantzschia amphioxys*	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Melosira	*Melosira ambigua*	0	0	0	0	0	0	0	0	2	0	0	0	0	0
	Melosira varians	1	21	4	2	0	22	0	12	150	0	154	63	115	0
Meridion	*Meridion circulare*	0	0	0	0	0	0	0	2	0	0	0	0	0	0
	Meridion circulare var. *constrictum*	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Navicula	*Navicula amphiceropsis*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula angusta	0	2	0	0	0	4	0	3	0	1	0	0	1	3
	Navicula arvensis	1	0	1	0	0	0	0	0	0	0	0	0	0	0
	Navicula atomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula bacillum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula capitata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula cincta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula cocconeiformis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula contenta	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula cryptocephala	4	20	6	54	3	15	5	5	8	7	11	6	13	4
	Navicula cuspidata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula decussis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula gregaria	0	0	0	2	0	0	0	0	0	0	2	0	0	0
	Navicula halophila	0	0	0	0	0	0	0	2	0	0	0	0	0	2
	Navicula laevissima	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula meniculus var. *obtusa*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula menisculus	0	4	2	0	0	4	2	1	0	0	4	3	0	0
	Navicula menisculus var. *upsaliensis*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula mutica	0	0	0	0	0	0	0	0	0	0	0	2	0	0
	Navicula notha	0	0	0	0	0	22	0	6	6	0	0	19	0	20
	Navicula pelliculosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula peregrina	0	0	0	0	0	0	0	3	0	0	0	0	0	0
	Navicula phyllepta	2	8	0	0	0	3	0	1	0	0	0	0	3	0
	Navicula phylleptosoma	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula protracta	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula pseudoscutiformis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula pupula	0	0	0	0	0	2	0	2	0	0	0	0	0	0
	Navicula radiosa	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

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	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
	Navicula radiosa var. *parva*	4	0	8	0	0	0	2	0	1	4	3	0	0	0
	Navicula radiosa var. *tenella*	5	38	6	4	0	8	0	4	3	7	12	9	4	1
	Navicula rhynchocephala	0	0	0	0	0	1	0	2	1	2	2	3	0	0
	Navicula rhynchocephala var. *germainii*	0	1	0	0	0	2	1	0	0	0	0	0	0	0
	Navicula sp.	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula subminuscula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula submolesta	0	0	0	0	0	2	0	0	0	0	0	0	0	0
	Navicula symmetrica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Navicula tripunctata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula trivialis	0	0	0	0	0	2	0	0	0	0	0	1	0	0
	Navicula veneta	0	4	0	0	0	3	0	0	0	0	1	0	1	0
	Navicula vilaplanii	1	0	0	0	0	0	0	0	3	0	0	0	1	0
	Navicula viridula	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Navicula viridula var. *avenacea*	0	0	0	0	0	1	0	0	0	0	1	0	0	0
	Navicula viridula var. *linearis*	0	0	0	2	0	0	0	0	0	0	0	0	0	0
	Navicula viridula var. *rostellata*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neidium	*Neidium hercynicum*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Neidium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitzschia	*Nitzschia abridia*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia acicularis	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Nitzschia amphibia	3	6	0	18	9	2	0	2	0	0	0	2	0	0
	Nitzschia amphibioides	4	31	0	0	124	2	0	0	0	0	0	0	0	0
	Nitzschia angustata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia capitellata	2	0	0	0	0	5	0	1	0	0	0	3	0	6
	Nitzschia clausii	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia communis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia dissipata	0	2	0	0	0	0	4	3	2	0	2	0	0	0
	Nitzschia filiformis	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Nitzschia fonticola	0	1	0	0	1	0	2	0	0	0	0	0	0	0
	Nitzschia frustulum	0	2	0	0	0	3	0	4	0	0	0	6	0	0
	Nitzschia frustulum var. *perminuta*	0	9	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia graciliformis	0	0	0	0	0	0	0	2	0	0	0	0	0	0
	Nitzschia gracilis	0	0	0	0	0	0	0	0	0	0	0	4	0	0
	Nitzschia heufleriana	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia inconspicua	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia intermedia	1	0	2	0	0	0	0	0	0	0	1	0	0	0
	Nitzschia lancettula	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	Nitzschia linearis	0	0	2	0	0	3	1	1	0	0	0	0	0	0

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	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
	Nitzschia microcephala	0	6	0	6	0	2	0	3	0	0	0	0	0	0
	Nitzschia palea	2	22	0	6	5	11	3	7	13	22	2	12	4	3
	Nitzschia palea var. *debilis*	0	0	0	12	0	0	0	0	0	0	0	0	0	0
	Nitzschia pura	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia pusilla	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia rosenstockii	12	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nitzschia sigma	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia sinuata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia sociabilis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia sp.	0	12	0	10	0	12	2	18	0	17	0	2	0	12
	Nitzschia subinflata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nitzschia umbonata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Pinnularia	*Pinnularia abaujensis* var. *linearis*	0	0	0	0	0	0	2	0	0	0	0	0	2	0
	Pinnularia biceps var. *pusilla*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pinnularia mesolepta	0	0	0	0	0	1	0	0	0	0	0	0	2	0
	Pinnularia microstauron	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pinnularia sp.	0	0	2	0	0	0	0	0	0	0	1	0	0	0
	Pinnularia subcapitata	0	0	0	0	0	1	0	2	0	0	0	0	1	1
Planothidium	*Planothidium frequentissimum*	0	8	0	0	0	2	0	7	0	0	0	7	1	2
Reimeria	*Reimeria sinuata*	3	2	3	2	0	3	0	7	0	0	0	0	0	1
Rhoicosphenia	*Rhoicosphenia curvata*	3	13	6	0	10	5	0	0	0	1	0	3	0	1
Stauroneis	*Stauroneis anceps* f. *linearis*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stauroneis smithii	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stauroneis tackei	0	0	0	0	0	2	4	0	0	0	0	0	0	0
Stenopterobia	*Stenopterobia delicatissima*	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Surirella	*Surirella angusta*	0	0	0	0	0	0	9	2	0	0	1	0	0	0
	Surirella brebissonii	0	0	0	0	0	2	0	0	0	0	0	0	0	0
	Surirella linearis var. *helvetica*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Surirella ovalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Surirella ovata	0	2	0	0	0	4	39	6	1	0	0	0	0	0
	Surirella ovata var. *crumena*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Surirella ovata var. *pinnata*	0	0	0	0	0	2	0	2	0	0	0	0	0	0
	Surirella tenera	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Synedra	*Synedra acus*	0	0	2	0	0	0	1	0	0	0	0	0	0	0
	Synedra incisa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra parasitica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra pulchella	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra rumpens	0	13	0	0	0	10	0	4	0	0	0	12	0	7

Palmerton Periphyton 2007 Lehigh River Taxa
Diatom Identifications

	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
	Synedra rumpens var. *familiaris*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Synedra rumpens var. *fragilarioides*	0	0	0	2	0	2	0	0	0	0	0	0	0	0
	Synedra rumpens var. *meneghiniana*	0	0	0	0	0	0	0	0	0	0	0	4	0	6
	Synedra sp.	0	8	0	0	0	21	0	18	0	0	0	0	0	0
	Synedra tenera	0	0	0	0	0	0	0	2	0	0	11	5	2	2
	Synedra ulna	3	3	0	0	0	1	13	1	5	2	13	0	3	2
	Synedra ulna var. *chaseana*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Synedra ulna var. *contracta*	0	4	0	0	0	7	0	2	3	0	1	4	0	17
Tabellaria	*Tabellaria fenestrata*	0	0	0	0	0	0	0	3	0	0	0	0	0	0
	Tabellaria flocculosa	0	0	2	0	2	5	0	0	1	0	2	2	7	15
	TOTAL	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**	**600**

Palmerton Periphyton 2007 Lehigh River Metrics

Diatom Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
Abundance Measures														
Species Richness	45.00	26.00	26.00	27.00	54.00	19.00	53.00	27.00	22.00	33.00	39.00	31.00	41.00	26.00
Number of Valves Counted	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Total Cells Counted	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Dominance Measures														
Dominant Taxon	*Cocconeis placentula* var. *lineata*	*Achnanthes minutissima*	*Fragilaria capucina*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Cocconeis placentula* var. *lineata*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Cocconeis placentula* var. *intermedia*	*Cocconeis placentula* var. *lineata*	*Cocconeis placentula* var. *lineata*	*Achnanthes minutissima*	*Achnanthes minutissima*	*Cocconeis placentula* var. *lineata*
Dominant Taxon Abundance	104.00	223.00	124.00	224.00	158.00	244.00	283.00	398.00	326.00	188.00	264.00	188.00	211.00	215.00
2nd Dominant Taxon	*Achnanthes subhudsonis*	*Fragilaria crotonensis*	*Gomphonema minutum*	*Fragilaria crotonensis*	*Achnanthes subhudsonis*	*Nitzschia amphibioides*	*Fragilaria crotonensis*	*Surirella ovata*	*Achnanthes minutissima*	*Melosira varians*	*Achnanthes minutissima*	*Melosira varians*	*Cocconeis placentula* var. *lineata*	*Achnanthes minutissima*
2nd Dominant Taxon Abundance	54.00	169.00	124.00	170.00	71.00	124.00	50.00	39.00	158.00	150.00	63.00	154.00	193.00	192.00
3rd Dominant Taxon	*Achnanthes minutissima*	*Fragilaria capucina*	*Cocconeis placentula* var. *euglypta*	*Fragilaria capucina*	*Cocconeis placentula* var. *lineata*	*Achnanthes minutissima*	*Cocconeis placentula* var. *lineata*	*Fragilaria crotonensis*	*Fragilaria* sp.	*Achnanthes minutissima*	*Melosira varians*	*Cocconeis placentula* var. *lineata*	*Cymbella minuta*	*Melosira varians*
3rd Dominant Taxon Abundance	52.00	119.00	68.00	121.00	63.00	101.00	34.00	37.00	24.00	149.00	63.00	132.00	25.00	115.00
4th Dominant Taxon	*Fragilaria capucina*	*Cocconeis placentula* var. *lineata*	*Navicula cryptocephala*	*Cymbella subturgidula*	*Cocconeis placentula*	*Achnanthes subhudsonis*	*Cymbella minuta*	*Cymbella minuta*	*Nitzschia palea*	*Nitzschia palea*	*Cocconeis placentula* var. *euglypta*	*Cymbella minuta*	*Navicula notha*	*Navicula cryptocephala*
4th Dominant Taxon Abundance	50.00	14.00	54.00	10.00	30.00	71.00	27.00	26.00	22.00	13.00	35.00	17.00	20.00	13.00
5th Dominant Taxon	*Navicula radiosa* var. *tenella*	*Cymbella minuta*	*Achnanthes linearis*	*Cymbella minuta*	*Fragilaria capucina*	*Gomphonema subclavatum* var. *mexicanum*	*Nitzschia* sp.	*Fragilaria capucina*	*Nitzschia* sp.	*Gomphonema parvulum*	*Cymbella minuta*	*Synedra ulna*	*Synedra ulna* var. *contracta*	*Cymbella minuta*
5th Dominant Taxon Abundance	38.00	12.00	46.00	8.00	23.00	11.00	18.00	19.00	17.00	11.00	24.00	13.00	17.00	9.00
% Dominant Taxon	17.33	37.17	20.67	37.33	26.33	40.67	47.17	66.33	54.33	31.33	44.00	31.33	35.17	35.83
% 2nd Dominant Taxon	9.00	28.17	20.67	28.33	11.83	20.67	8.33	6.50	26.33	25.00	10.50	25.67	32.17	32.00
% 3rd Dominant Taxon	8.67	19.83	11.33	20.17	10.50	16.83	5.67	6.17	4.00	24.83	10.50	22.00	4.17	19.17
% 4th Dominant Taxon	8.33	2.33	9.00	1.67	5.00	11.83	4.50	4.33	3.67	2.17	5.83	2.83	3.33	2.17
% 5th Dominant Taxon	6.33	2.00	7.67	1.33	3.83	1.83	3.00	3.17	2.83	1.83	4.00	2.17	2.83	1.50
Diversity/Evenness Measures														
Shannon-Weaver H' (log e)	3.05	1.74	2.47	1.75	2.95	1.72	2.44	1.52	1.47	1.94	2.28	1.99	2.14	1.68
Shannon-Weaver H' (log 10)	1.32	0.76	1.07	0.76	1.28	0.75	1.06	0.66	0.64	0.84	0.99	0.87	0.93	0.73

Palmerton Periphyton 2007 Lehigh River Metrics

Diatom Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
Shannon-Weaver H' (log 2)	4.39	2.52	3.56	2.52	4.26	2.48	3.51	2.19	2.13	2.80	3.30	2.87	3.08	2.43
Margalef's Richness	6.88	3.91	3.91	4.06	8.29	2.81	8.13	4.06	3.28	5.00	5.94	4.69	6.25	3.91
Van Dam Indices														
Van Dam pH	3.51	3.34	3.23	3.33	3.30	3.67	3.24	3.12	3.62	3.60	3.67	3.53	3.33	3.54
Van Dam Salinity	2.04	2.00	1.98	1.99	1.94	1.99	2.00	1.98	1.99	1.98	1.95	1.99	1.92	1.98
Van Dam Nitrogen Uptake	2.24	2.02	2.25	2.00	2.05	2.04	2.04	1.98	2.06	2.31	2.15	2.28	1.92	2.18
Van Dam Oxygen Tolerance	2.62	1.55	3.01	1.50	1.98	2.43	1.51	1.20	2.42	2.43	2.66	2.25	1.96	2.28
Van Dam Saprobity	2.37	2.04	2.27	2.03	2.16	2.07	2.08	2.01	2.12	2.36	2.20	2.33	2.02	2.23
Van Dam Trophic State	5.04	4.78	4.58	4.76	5.43	5.52	5.75	6.29	5.59	5.46	5.06	5.65	5.54	5.59
Van Dam Moisture	2.31	2.15	2.24	2.14	2.53	2.32	2.56	2.75	2.34	2.31	2.18	2.37	2.49	2.38
pH Preference														
% at Optimal Occurance pH 5.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Mainly Occuring at pH<7	1.00	0.00	0.00	0.36	7.95	1.05	3.32	1.31	0.37	2.28	5.09	2.69	9.14	3.26
% Mainly Occuring at pH~7	47.87	66.43	76.87	66.31	54.55	30.53	69.34	85.39	37.08	35.09	23.45	41.76	48.69	39.00
% Mainly Occuring at pH>7	50.63	33.57	22.78	33.33	37.27	68.42	27.34	13.30	62.55	62.63	70.55	55.38	41.79	57.73
% Exclusively Occuring at pH>7	0.50	0.00	0.36	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.91	0.18	0.37	0.00
% at no Apparent Optimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified pH	33.50	7.17	6.33	6.50	26.67	36.67	14.67	11.00	9.67	5.00	8.33	7.00	10.67	3.00
Richness at pH <5.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Richness at pH <7	2.00	0.00	0.00	1.00	6.00	2.00	6.00	2.00	2.00	5.00	4.00	3.00	8.00	6.00
Richness at pH ~7	12.00	9.00	10.00	10.00	10.00	6.00	10.00	7.00	7.00	8.00	9.00	8.00	9.00	7.00
Richness at pH >7	14.00	4.00	9.00	7.00	19.00	6.00	23.00	10.00	6.00	10.00	12.00	12.00	11.00	5.00
Richness Exclusively at pH >7	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	0.00
Richness at no Optimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salinity Preference														
% Fresh	1.23	0.35	2.33	1.07	9.82	1.58	3.52	1.87	0.74	2.82	6.52	2.70	9.91	3.42

Palmerton Periphyton 2007 Lehigh River Metrics

Diatom Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
% Fresh-Brackish	95.31	99.30	97.29	98.93	86.99	98.16	94.52	98.13	99.26	96.83	91.85	95.86	89.35	95.90
% Brackish-Fresh	1.48	0.00	0.39	0.00	2.28	0.26	0.78	0.00	0.00	0.35	1.63	1.26	0.00	0.17
% Brackish	1.98	0.35	0.00	0.00	0.91	0.00	1.17	0.00	0.00	0.00	0.00	0.18	0.75	0.51
% Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Salinity	32.50	4.83	14.00	6.83	27.00	36.67	14.83	10.67	10.00	5.33	8.00	7.33	10.83	2.50
Richness Fresh	3.00	1.00	1.00	3.00	6.00	3.00	6.00	3.00	3.00	7.00	7.00	3.00	9.00	6.00
Richness Fresh-Brackish	23.00	13.00	17.00	14.00	25.00	10.00	29.00	16.00	11.00	14.00	19.00	16.00	17.00	11.00
Richness Brackish-Fresh	2.00	0.00	1.00	0.00	4.00	1.00	1.00	0.00	0.00	1.00	3.00	3.00	0.00	1.00
Richness Brackish	1.00	1.00	0.00	0.00	2.00	0.00	3.00	0.00	0.00	0.00	0.00	1.00	2.00	1.00
Richness Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Uptake Metabolism														
% Very Small Tolerance N	4.58	0.47	5.71	1.87	11.69	1.60	5.46	2.87	2.64	2.73	6.58	2.65	11.38	4.36
% Elevated Tolerance N	76.47	97.18	69.52	96.73	76.10	94.40	87.99	96.51	93.02	65.57	75.05	66.73	86.03	74.00
% Needing Periodically Elevated N	9.15	1.88	19.05	1.40	8.05	2.67	3.49	0.00	0.19	29.33	14.89	30.25	1.80	20.94
% Needing Continuously Elevated N	9.80	0.47	5.71	0.00	4.16	1.33	3.06	0.62	4.15	2.37	3.48	0.38	0.80	0.70
% Unclassified Nitrogen	49.00	29.17	65.00	28.67	35.83	37.50	23.67	18.83	11.67	8.50	13.83	11.83	16.50	4.50
Richness at Small Tolerance N	4.00	1.00	2.00	4.00	7.00	3.00	9.00	4.00	6.00	7.00	7.00	3.00	11.00	8.00
Richness at Elevated Tolerance N	14.00	5.00	7.00	8.00	16.00	6.00	17.00	11.00	4.00	8.00	12.00	12.00	9.00	6.00
Richness at Periodic Elevated N	3.00	3.00	3.00	2.00	3.00	2.00	3.00	0.00	1.00	2.00	3.00	2.00	2.00	2.00
Richness at Continuously Elevated N	3.00	1.00	2.00	0.00	3.00	1.00	3.00	1.00	1.00	1.00	2.00	1.00	2.00	1.00
Oxygen Requirements														
% at Continuously High Oxygen	22.22	53.18	3.81	54.44	52.71	28.80	68.91	84.60	30.75	29.33	18.30	38.00	52.20	36.13
% at Fairly High Oxygen	2.61	40.24	4.76	41.12	2.07	1.33	13.48	11.29	1.70	2.73	2.12	1.89	2.20	1.75
% at Moderate Oxygen	66.34	5.18	78.10	3.97	39.53	68.27	15.22	3.49	62.83	63.39	74.37	57.66	43.40	60.38

Palmerton Periphyton 2007 Lehigh River Metrics

Diatom Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
% at Low Oxygen	8.82	1.41	13.33	0.47	5.68	1.33	2.39	0.62	4.72	4.55	5.20	2.46	2.20	1.75
% at Very Low Oxygen	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Oxygen	49.00	29.17	65.00	28.67	35.50	37.50	23.33	18.83	11.67	8.50	13.50	11.83	16.67	4.50
Richness at High Oxygen	6.00	2.00	3.00	5.00	8.00	4.00	11.00	5.00	5.00	6.00	7.00	3.00	10.00	7.00
Richness at Fairly High Oxygen	6.00	2.00	2.00	4.00	4.00	3.00	7.00	7.00	2.00	5.00	5.00	5.00	5.00	2.00
Richness at Moderate Oxygen	9.00	4.00	6.00	4.00	14.00	3.00	12.00	3.00	2.00	4.00	9.00	5.00	6.00	5.00
Richness at Low Oxygen	3.00	2.00	3.00	1.00	4.00	1.00	3.00	1.00	3.00	3.00	3.00	5.00	3.00	3.00
Richness at Very Low Oxygen	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Saprobity														
% Very Slightly Polluted	3.89	0.37	2.55	0.73	9.76	1.06	3.55	1.98	2.64	2.86	6.10	2.42	8.25	3.14
% Moderately Polluted	71.39	97.06	74.47	96.37	72.68	94.18	88.10	95.85	91.70	64.58	74.67	64.13	86.84	72.77
% Moderate-Heavily Polluted	16.11	1.47	17.45	2.54	12.44	3.17	6.47	1.58	1.32	28.26	14.67	31.78	1.77	22.34
% Heavily Polluted	1.39	0.73	4.26	0.36	2.44	0.26	0.42	0.00	0.19	1.97	2.29	1.30	1.38	1.05
% Very Heavily Polluted	7.22	0.37	1.28	0.00	2.68	1.32	1.46	0.59	4.15	2.33	2.29	0.37	1.77	0.70
% Unclassified Saprobity	40.00	9.17	21.67	8.17	31.67	37.00	20.17	15.67	11.67	6.83	12.50	10.33	15.17	4.50
Richness Very Slightly Polluted	4.00	1.00	1.00	2.00	6.00	2.00	7.00	3.00	6.00	7.00	6.00	2.00	10.00	7.00
Richness Moderately Polluted	12.00	6.00	9.00	9.00	14.00	7.00	17.00	10.00	3.00	9.00	12.00	12.00	9.00	5.00
Richness Moderate-Heavily Polluted	6.00	3.00	5.00	4.00	8.00	2.00	9.00	3.00	1.00	2.00	6.00	4.00	4.00	2.00
Richness Heavily Polluted	2.00	1.00	1.00	1.00	2.00	1.00	1.00	0.00	1.00	1.00	1.00	2.00	1.00	2.00
Richness Very Heavily Polluted	2.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Trophic State														
% Oligotrophic	1.10	0.00	2.53	0.00	1.47	0.53	1.45	0.59	0.38	0.54	0.57	0.00	1.77	1.22
% Oligo-Mesotrophic	2.49	0.00	0.00	0.00	6.36	0.00	2.69	1.38	1.69	1.62	5.34	2.05	6.10	1.57
% Mesotrophic	15.19	53.39	27.43	54.08	9.29	1.32	15.53	11.07	0.56	3.06	2.10	1.86	3.35	1.75

Palmerton Periphyton 2007 Lehigh River Metrics

Diatom Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
% Meso-Eutrophic	1.38	0.00	2.11	0.36	1.71	0.79	3.31	2.17	0.19	0.36	0.76	0.56	0.39	0.35
% Eutrophic	52.21	4.22	54.85	3.45	35.94	67.99	14.91	4.55	61.58	63.60	75.19	57.73	44.09	58.64
% Hypereutrophic	7.18	0.37	1.27	0.00	2.69	1.32	1.45	0.59	4.14	2.34	2.29	0.37	1.77	0.70
% Oligo-to-Eutrophic	20.44	42.02	11.81	42.11	42.54	28.04	60.66	79.64	31.45	28.47	13.74	37.43	42.52	35.78
% Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Trophic	39.67	9.17	21.00	8.17	31.83	37.00	19.50	15.67	11.50	7.50	12.67	10.50	15.33	4.50
Richness Oligotrophic	2.00	0.00	1.00	0.00	2.00	1.00	3.00	1.00	2.00	2.00	2.00	0.00	3.00	2.00
Richness Oligo-Mesotrophic	1.00	0.00	0.00	0.00	4.00	0.00	4.00	2.00	2.00	3.00	4.00	1.00	6.00	4.00
Richness Mesotrophic	4.00	3.00	3.00	5.00	4.00	2.00	4.00	2.00	2.00	3.00	4.00	3.00	3.00	3.00
Richness Meso-Eutrophic	3.00	0.00	2.00	1.00	4.00	2.00	6.00	4.00	1.00	1.00	2.00	2.00	1.00	1.00
Richness Eutrophic	11.00	5.00	9.00	7.00	14.00	4.00	14.00	5.00	2.00	5.00	10.00	11.00	8.00	4.00
Richness Hypereutrophic	2.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Richness Oligo-to-Eutrophic	4.00	3.00	2.00	3.00	3.00	3.00	5.00	2.00	3.00	3.00	3.00	3.00	3.00	2.00
Richness Dystrophic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moisture														
% Never Outside Water	2.94	40.38	3.60	40.47	1.91	1.33	14.41	10.47	0.19	2.39	2.18	2.06	1.45	0.35
% Mainly in Water, Sometimes Wet	63.73	4.46	68.47	5.35	43.17	66.13	14.86	3.90	65.66	64.22	77.58	58.91	47.72	61.43
% Mainly in Water, Regularly Wet	33.01	55.16	27.93	54.19	54.92	31.73	70.73	85.63	34.15	33.03	19.84	38.65	50.83	38.22
% Mainly Wet, Moist or Temporarily Dry	0.33	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.37	0.40	0.38	0.00	0.00
% Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Unclassified Moisture	49.00	29.00	63.00	28.33	39.00	37.50	24.83	18.83	11.67	9.17	16.00	11.17	19.67	4.50
Richness Never Outside Water	3.00	3.00	2.00	3.00	5.00	3.00	6.00	5.00	1.00	4.00	5.00	4.00	4.00	1.00
Richness Mainly in Water, Sometimes Wet	10.00	3.00	6.00	7.00	12.00	3.00	12.00	5.00	8.00	6.00	11.00	6.00	10.00	7.00
Richness Mainly in Water, Regularly	10.00	5.00	7.00	5.00	13.00	5.00	13.00	6.00	3.00	7.00	8.00	10.00	9.00	9.00

Palmerton Periphyton 2007 Lehigh River Metrics

Diatom Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
Wet														
Richness Mainly Wet, Moist or Temporarily Dry	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00
Richness Nearly Exclusively Outside Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Morphological Guild (JS)														
% Erect	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.48	0.00	1.79	0.00	2.36	0.00
% Stalked	14.23	2.90	40.95	2.18	5.85	1.53	6.59	5.01	5.24	5.66	16.07	5.58	11.15	4.43
% Unattached	8.70	0.18	0.86	1.45	10.82	2.29	3.30	0.00	0.95	41.24	31.70	37.86	5.74	34.35
% Prostrate/Adnate	57.31	44.75	31.47	43.56	76.61	93.89	73.41	83.43	93.33	48.79	48.21	54.61	80.74	61.22
% Variable	19.76	52.17	26.72	52.81	6.73	2.29	15.82	11.56	0.00	4.31	2.23	1.94	0.00	0.00
% Unclassified Morphological Guild	57.83	8.00	22.67	8.17	43.00	78.17	24.17	13.50	65.00	38.17	62.67	31.33	50.67	39.83
Richness Erect	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00	0.00	2.00	0.00	2.00	0.00
Richness Stalked	2.00	2.00	4.00	3.00	2.00	1.00	3.00	1.00	3.00	3.00	2.00	2.00	3.00	3.00
Richness Unattached	2.00	1.00	2.00	3.00	4.00	2.00	2.00	0.00	1.00	3.00	5.00	2.00	2.00	3.00
Richness Prostrate/Adnate	17.00	7.00	9.00	7.00	21.00	7.00	21.00	11.00	8.00	10.00	11.00	14.00	14.00	9.00
Richness Variable	1.00	2.00	1.00	2.00	1.00	1.00	3.00	3.00	0.00	2.00	2.00	2.00	0.00	0.00
Motility (JS)														
% Highly Motile	22.50	3.85	6.41	0.69	6.37	40.88	5.30	3.54	10.00	3.80	9.49	1.38	2.49	1.07
% Moderately Motile	11.94	2.63	14.10	3.45	15.38	2.35	7.33	2.99	10.45	5.57	14.23	5.75	11.21	9.38
% Not Motile	55.28	91.42	69.66	92.40	75.38	56.18	81.26	88.25	74.55	87.59	65.22	88.51	76.01	86.60
% Variable Motility	10.28	2.10	9.83	3.45	2.86	0.59	6.11	5.22	5.00	3.04	11.07	4.37	10.28	2.95
% Unclassified Motility	40.00	4.83	22.00	3.50	24.17	43.33	18.17	10.67	63.33	34.17	57.83	27.50	46.50	37.83
Richness Highly Motile	10.00	5.00	3.00	2.00	9.00	4.00	9.00	5.00	1.00	2.00	4.00	4.00	4.00	1.00
Richness Moderately Motile	8.00	6.00	4.00	5.00	17.00	3.00	12.00	6.00	6.00	7.00	7.00	8.00	8.00	11.00
Richness Not Motile	9.00	8.00	9.00	12.00	13.00	7.00	14.00	10.00	5.00	12.00	13.00	11.00	9.00	6.00
Richness Variable Motility	2.00	1.00	2.00	3.00	1.00	1.00	3.00	2.00	3.00	3.00	3.00	2.00	4.00	2.00
Pollution Tolerance (LB)														
% Very Tolerant	8.33	20.00	20.67	20.67	5.83	0.50	3.00	3.33	0.00	1.67	1.00	1.00	0.33	0.00

Palmerton Periphyton 2007 Lehigh River Metrics

Diatom Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
% Moderately Tolerant	12.33	32.50	2.67	31.33	11.00	23.00	16.17	8.33	1.00	29.50	16.17	30.00	3.67	20.67
% Sensitive/Intolerant	31.33	41.67	40.33	43.50	47.33	31.83	59.33	76.17	31.17	29.67	19.17	38.50	45.50	38.67
Richness Very Tolerant	1.00	2.00	1.00	3.00	3.00	1.00	2.00	2.00	0.00	2.00	2.00	1.00	1.00	0.00
Richness Moderately Tolerant	7.00	8.00	5.00	6.00	13.00	3.00	11.00	6.00	2.00	10.00	9.00	10.00	2.00	6.00
Richness Sensitive/Intolerant	14.00	8.00	6.00	10.00	15.00	8.00	16.00	11.00	8.00	7.00	11.00	9.00	11.00	9.00
Pollution Tolerance (Lang-Bertalot modified by Bohls)	2.44	2.23	2.31	2.24	2.65	2.57	2.72	2.83	2.97	2.46	2.50	2.54	2.91	2.65
Other Measures														
% Rhopalodiales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	8.67	37.17	0.33	37.33	26.33	16.83	47.17	66.33	26.33	24.83	10.50	31.33	35.17	32.00
% Siltation Index	28.83	6.83	19.00	4.50	19.50	23.67	13.33	11.67	10.00	6.33	12.00	7.00	9.33	4.50
Siltation Richness	19.00	12.00	9.00	7.00	24.00	5.00	22.00	11.00	7.00	9.00	13.00	12.00	11.00	7.00
% Aerophiles	41.17	90.17	55.33	91.83	52.83	23.00	77.67	84.17	35.17	61.67	37.33	69.67	49.50	59.00
% Centrics	3.50	0.17	0.33	0.67	3.67	0.17	2.00	0.00	0.00	25.33	10.83	26.33	0.00	19.17
% Stability Index	14.00	48.83	21.67	49.83	13.33	1.83	20.83	12.67	5.17	5.17	6.33	6.83	10.00	2.33
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Palmerton Periphyton 2007 Lehigh River Taxa
Soft Body Algae Identifications

	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
DIATOMS	*Achnanthes* sp.	13	46	57	8	112	88	49	99	87	6	19	54	41	82
	Amphora sp.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Brachysira sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Caloneis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Cocconeis sp.	1	128	11	63	114	67	0	118	77	237	7	124	22	114
	Cyclotella sp.	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	Cymatopleura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cymbella sp.	0	0	2	1	0	4	0	2	0	0	0	0	0	1
	Diatoma sp.	0	0	0	0	1	0	0	12	0	0	0	0	0	2
	Epithemia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eucocconeis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eunotia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Fragilaria sp.	38	103	120	10	0	12	0	7	0	0	0	0	0	0
	Frustulia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gomphonema sp.	1	0	0	1	5	1	0	0	0	0	1	0	0	0
	Hannaea sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mastogloia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Melosira sp.	52	1	15	3	1	12	0	7	0	0	103	31	110	0
	Meridion sp.	0	0	0	2	0	0	0	0	0	0	0	0	0	0
	Navicula sp.	1	1	0	8	3	9	0	6	2	2	7	0	2	8
	Nitzschia sp.	0	0	0	4	0	1	0	0	0	3	0	0	1	3
	Pinnularia sp.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Reimeria sinuata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhoicosphenia sp.	0	0	0	19	0	2	0	0	0	0	0	0	0	0
	Rhopalodia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stauroneis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Surirella sp.	1	0	0	0	0	1	1	0	0	0	1	0	0	0
	Synedra sp.	1	0	0	0	0	16	2	4	2	2	2	0	12	2
	Tabellaria sp.	0	0	0	0	0	0	0	2	0	0	0	0	0	2

Palmerton Periphyton 2007 Lehigh River Taxa
Soft Body Algae Identifications

	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
	Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
	EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
	DIATOM SUBTOTAL	108	279	205	119	236	213	52	257	169	250	140	211	188	214
SOFT BODY ALGAE	*Anabaena* sp.	10	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ankistrodesmus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Aphanizomenon sp.	0	0	0	0	0	0	11	0	0	0	0	0	0	0
	Botryococcus sp.	0	0	0	0	2	0	0	2	3	0	0	0	0	0
	Characiopsis sp.	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	Chlamydononas sp.	0	0	0	0	0	2	0	0	0	0	25	0	0	0
	Chlorella sp.	0	0	0	9	6	2	0	0	5	1	53	2	0	5
	Chroococcus sp.	0	0	0	0	0	0	0	0	0	0	0	2	0	0
	Cladophora sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Closterium sp.	0	0	0	0	0	0	0	0	0	0	3	0	2	0
	Coelastrum sp.	0	0	0	0	0	3	0	3	0	1	0	0	0	1
	Cosmarium sp.	2	0	0	0	0	0	0	0	0	0	4	0	0	0
	Dictyosphaerium sp.	0	0	0	0	0	0	0	0	2	0	0	0	0	0
	Dinobryon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Euglena sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gloeocapsa sp.	0	0	0	7	2	0	34	0	14	0	1	0	0	0
	Gongrosira sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	LGBs	21	20	0	62	0	26	0	19	0	16	0	47	0	49
	Mallomonas sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Merismopedia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Microcystis sp.	4	1	0	52	37	41	1	19	62	13	14	29	55	19
	Microspora sp.	0	0	0	0	0	0	78	0	0	0	0	0	0	0
	Mougeotia sp.	0	0	85	0	0	0	0	0	2	0	0	0	0	0
	Netrium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oedogonium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Periphyton 2007 Lehigh River Taxa
Soft Body Algae Identifications

Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer
Collection Date	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007	08-16-2007
EcoAnalysts Sample ID	5053-6	5053-46	5053-7	5053-47	5053-8	5053-48	5053-9	5053-49	5053-10	5053-50	5053-11	5053-51	5053-12	5053-52
Oocystis sp.	5	0	0	21	10	6	21	0	6	17	33	7	0	6
Oscillatoria sp.	0	0	0	0	0	1	0	0	6	0	0	0	0	0
Pediastrum sp.	3	0	0	0	2	0	0	0	0	0	0	0	0	0
Phacus sp.	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Phormidium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleurotaenium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protoderma sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Raphidiopsis sp.	0	0	0	0	0	0	0	0	0	0	5	0	0	2
Rhizoclonium sp.	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Roya sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scendesmus sp.	60	0	0	5	0	0	103	0	0	1	0	2	55	2
Sphanerocystis sp.	0	0	0	2	5	0	0	0	0	0	22	0	0	0
Spirogyra sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Staurastrum sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stichosiphon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Stigeoclonium sp.	52	0	5	0	0	6	0	0	31	0	0	0	0	0
Synura sp.	0	0	5	21	0	0	0	0	0	0	0	0	0	0
Tetraedron	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ulothrix sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Volvox sp.	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Zygnema sp.	33	0	0	0	0	0	0	0	0	0	0	0	0	0
SOFT BODY SUBTOTAL	**192**	**21**	**95**	**181**	**64**	**87**	**248**	**43**	**131**	**50**	**160**	**89**	**112**	**86**
GRAND TOTAL	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**

Palmerton Periphyton 2007 Lehigh River Metrics
Soft Body Algae Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
Abundance Measures														
Species Richness	7.00	18.00	20.00	8.00	19.00	13.00	13.00	9.00	12.00	14.00	11.00	16.00	17.00	9.00
Number of Valves Counted	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Total Cells Counted	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Dominance Measures														
Dominant Taxon	*Cocconeis* sp.	*Scenedesmus* sp.	*Cocconeis* sp.	*Fragilaria* sp.	*Achnanthes* sp.	*Cocconeis* sp.	*Cocconeis* sp.	*Scenedesmus* sp.	*Cocconeis* sp.	*Achnanthes* sp.	*Cocconeis* sp.	*Melosira* sp.	*Cocconeis* sp.	*Melosira* sp.
Dominant Taxon Abundance	128.00	60.00	63.00	120.00	88.00	114.00	118.00	103.00	237.00	87.00	124.00	103.00	114.00	110.00
2nd Dominant Taxon	*Fragilaria* sp.	*Melosira* sp.	LGBs	*Mougeotia* sp.	*Cocconeis* sp.	*Achnanthes* sp.	*Achnanthes* sp.	*Microspora* sp.	*Oocystis* sp.	*Cocconeis* sp.	*Achnanthes* sp.	*Chlorella* sp.	*Achnanthes* sp.	*Microcystis* sp.
2nd Dominant Taxon Abundance	103.00	52.00	62.00	85.00	67.00	112.00	99.00	78.00	17.00	77.00	54.00	53.00	82.00	55.00
3rd Dominant Taxon	*Achnanthes* sp.	*Stigeoclonium* sp.	*Microcystis* sp.	*Achnanthes* sp.	*Microcystis* sp.	*Microcystis* sp.	LGBs	*Achnanthes* sp.	LGBs	*Microcystis* sp.	LGBs	*Oocystis* sp.	LGBs	*Scenedesmus* sp.
3rd Dominant Taxon Abundance	46.00	52.00	52.00	57.00	41.00	37.00	19.00	49.00	16.00	62.00	47.00	33.00	49.00	55.00
4th Dominant Taxon	LGBs	*Fragilaria* sp.	*Oocystis* sp.	*Melosira* sp.	LGBs	*Oocystis* sp.	*Microcystis* sp.	*Gloeocapsa* sp.	*Microcystis* sp.	*Stigeoclonium* sp.	*Melosira* sp.	*Chlamydomonas* sp.	*Microcystis* sp.	*Achnanthes* sp.
4th Dominant Taxon Abundance	20.00	38.00	21.00	15.00	26.00	10.00	19.00	34.00	13.00	31.00	31.00	25.00	19.00	41.00
5th Dominant Taxon	*Melosira* sp.	*Zygnema* sp.	*Synura* sp.	*Cocconeis* sp.	*Synedra* sp.	*Chlorella* sp.	*Diatoma* sp.	*Oocystis* sp.	*Achnanthes* sp.	*Gloeocapsa* sp.	*Microcystis* sp.	*Sphaerocystis* sp.	*Navicula* sp.	*Cocconeis* sp.
5th Dominant Taxon Abundance	1.00	33.00	21.00	11.00	16.00	6.00	12.00	21.00	6.00	14.00	29.00	22.00	8.00	22.00
% Dominant Taxon	42.67	20.00	21.00	40.00	29.33	38.00	39.33	34.33	79.00	29.00	41.33	34.33	38.00	36.67
% 2nd Dominant Taxon	34.33	17.33	20.67	28.33	22.33	37.33	33.00	26.00	5.67	25.67	18.00	17.67	27.33	18.33
% 3rd Dominant Taxon	15.33	17.33	17.33	19.00	13.67	12.33	6.33	16.33	5.33	20.67	15.67	11.00	16.33	18.33
% 4th Dominant Taxon	6.67	12.67	7.00	5.00	8.67	3.33	6.33	11.33	4.33	10.33	10.33	8.33	6.33	13.67
% 5th Dominant Taxon	0.33	11.00	7.00	3.67	5.33	2.00	4.00	7.00	2.00	4.67	9.67	7.33	2.67	7.33

Palmerton Periphyton 2007 Lehigh River Metrics

Soft Body Algae Metrics

Site	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Device	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape	Diatometer	Rock Scrape
Collection Date	08-16-2007	08-01-2007	08-16-2007	08-01-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-31-2007	08-16-2007	07-30-2007	08-16-2007	07-30-2007
EcoAnalysts Sample ID	5053-46	5053-6	5053-47	5053-7	5053-48	5053-8	5053-49	5053-9	5053-50	5053-10	5053-51	5053-11	5053-52	5053-12
Diversity/Evenness Measures														
Shannon-Weaver H' (log e)	1.26	2.20	2.32	1.48	2.13	1.51	1.67	1.64	0.91	1.83	1.65	2.07	1.73	1.67
Shannon-Weaver H' (log 10)	0.55	0.96	1.01	0.64	0.93	0.65	0.72	0.71	0.39	0.80	0.72	0.90	0.75	0.72
Shannon-Weaver H' (log 2)	1.81	3.18	3.35	2.14	3.08	2.17	2.41	2.36	1.31	2.65	2.38	2.99	2.49	2.41
Margalef's Richness	1.05	2.98	3.33	1.23	3.16	2.10	2.10	1.40	1.93	2.28	1.75	2.63	2.81	1.40
Other Measures														
% Rhopalodiales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Achnanthes minutissima (Disturbance Index)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Siltation Index	0.33	0.67	4.00	0.00	3.67	1.00	2.00	0.33	1.67	0.67	0.00	2.67	3.67	1.00
Siltation Richness	1.00	2.00	2.00	0.00	3.00	1.00	1.00	1.00	2.00	1.00	0.00	2.00	2.00	2.00
% Aerophiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Centrics	0.33	17.33	1.00	5.00	4.00	0.33	2.33	0.00	0.00	0.33	10.33	34.33	0.00	36.67
% Stability Index	34.33	13.00	3.33	40.00	9.33	0.33	8.33	0.67	0.67	0.67	0.00	0.67	2.00	4.00
% Heavy Metals Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX 3. 2006-2007 Macroinvertebrate Taxa and Metrics

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Taxa							
Data are NOT adjusted for subsampling							
	Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
	EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
Ephemeroptera	*Acentrella turbida*	6	2	4	10	0	2
	Baetis flavistriga	0	0	0	0	0	0
	Baetis intercalaris	1	0	0	0	0	0
	Baetis pluto	1	0	0	0	0	1
	Baetis sp.	0	1	4	0	0	0
	Baetis tricaudatus	16	6	0	0	0	0
	Caenis sp.	0	0	5	0	18	1
	Centroptilum sp.	0	0	1	0	1	0
	Epeorus sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Ephemerella invaria	0	0	0	2	0	0
	Ephemerella sp.	1	0	0	0	0	3
	Ephemerellidae	*0*	*0*	*0*	*0*	*0*	*0*
	Eurylophella sp.	36	15	21	1	44	0
	Heptageniidae	0	0	1	0	3	0
	Heterocloeon sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Isonychia sp.	0	1	9	21	24	31
	Leptophlebiidae	2	1	1	0	2	0
	Leucrocuta sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium ithaca	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium mediopunctatum	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium modestum	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium pulchellum	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Plauditus sp.	0	0	0	0	0	0
	Procloeon sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Pseudocloeon propinquum	0	0	1	0	0	0
	Serratella deficiens	0	0	0	1	0	1
	Serratella serrata	*0*	*0*	*0*	*0*	*0*	*0*
	Serratella serratoides	*0*	*0*	*0*	*0*	*0*	*0*
	Stenacron interpunctatum	0	0	0	0	0	0
	Stenonema modestum	9	0	12	0	13	12
	Stenonema sp.	0	4	1	16	0	1
	Tricorythodes sp.	*0*	*0*	*0*	*0*	*0*	*0*
Odonata	*Argia* sp.	0	0	0	0	0	0
	Boyeria sp.	0	0	0	0	0	0
	Boyeria vinosa	0	0	0	0	3	0
	Calopterygidae	0	1	0	0	0	1
	Calopteryx sp.	2	0	0	0	4	0
	Coenagrion/Enallagma sp.	0	0	0	0	0	0
	Coenagrionidae	0	0	0	0	0	0
	Gomphidae	0	2	3	2	3	1
	Gomphus sp.	0	0	0	0	0	0
	Hagenius brevistylus	0	0	0	0	1	0
	Libellulidae	0	0	0	0	0	0
	Macromia illinoiensis	0	0	0	0	0	0
	Macromia sp.	0	0	0	0	0	0

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Taxa							
Data are NOT adjusted for subsampling							
	Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
	EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
	Macromiinae	0	0	1	0	2	0
	Ophiogomphus sp.	0	0	0	0	1	0
	Stylogomphus albistylus	2	0	0	0	1	0
Plecoptera	*Acroneuria abnormis*	2	2	0	2	4	7
	Acroneuria sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Capniidae	0	0	2	4	6	0
	Leuctra sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Paragnetina immarginata	0	0	0	0	0	0
	Paragnetina media	0	0	0	0	0	0
	Paragnetina sp.	0	0	0	1	0	0
	Perlidae	0	0	0	0	0	1
	Perlodidae	0	0	0	0	0	1
	Plecoptera	0	0	0	0	0	1
	Pteronarcys sp.	1	0	0	0	0	0
	Sweltsa sp.	3	0	0	1	0	1
	Taeniopteryx sp.	1	0	3	3	13	5
	Tallaperla sp.	0	1	1	1	0	0
Hemiptera	Corixidae	0	0	1	0	0	0
	Neoplea sp.	*0*	*0*	*0*	*0*	*0*	*0*
Coleoptera	*Berosus* sp.	0	0	0	0	0	0
	Dubiraphia sp.	3	1	17	0	4	0
	Ectopria sp.	0	0	1	0	0	0
	Helichus sp.	0	0	0	1	0	0
	Hydrophilidae	*0*	*0*	*0*	*0*	*0*	*0*
	Laccobius sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Macronychus glabratus	0	0	0	0	0	1
	Microcylloepus sp.	0	0	0	0	2	0
	Optioservus ovalis	0	0	0	0	19	0
	Optioservus sp.	0	0	0	9	0	0
	Optioservus trivittatus	0	0	19	0	0	3
	Oulimnius latiusculus	0	3	0	1	10	0
	Oulimnius nitidulus	0	4	5	1	0	10
	Oulimnius sp.	1	0	0	0	0	0
	Peltodytes sp.	0	0	0	0	1	0
	Promoresia tardella	0	1	0	4	1	0
	Psephenus herricki	2	5	0	0	3	0
	Stenelmis sp.	1	1	1	1	3	5
Megaloptera	Corydalidae	*0*	*0*	*0*	*0*	*0*	*0*
	Corydalus cornutus	0	0	0	0	0	1
	Nigronia serricornis	1	1	0	0	2	0
	Sialis sp.	0	0	1	0	0	0
Diptera-Chironomidae	*Ablabesmyia mallochi*	0	0	1	0	2	0
	Brillia sp.	1	2	0	1	0	0
	Cardiocladius sp.	0	1	0	0	0	0
	Chironomini	0	0	0	0	0	0
	Chironomus sp.	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Taxa							
Data are NOT adjusted for subsampling							
	Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
	EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
	Cladotanytarsus sp.	0	0	9	0	0	0
	Corynoneura sp.	2	0	0	0	0	0
	Cricotopus bicinctus gr.	3	0	2	0	3	2
	Cricotopus sp.	0	0	0	0	1	0
	Cricotopus trifascia gr.	0	0	0	0	0	0
	Cryptochironomus sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Diamesa sp.	1	0	0	0	0	0
	Dicrotendipes modestus	0	0	0	0	0	0
	Dicrotendipes sp.	1	0	0	0	0	0
	Diplocladius sp.	0	0	1	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0
	Eukiefferiella devonica gr.	2	1	1	0	0	0
	Eukiefferiella pseudomontana gr.	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0
	Eukiefferiella tirolensis	0	1	0	0	0	0
	Gymnometriocnemus sp.	1	0	0	0	0	0
	Limnophyes sp.	3	1	0	0	0	0
	Micropsectra sp.	4	5	0	1	0	4
	Micropsectra/Tanytarsus sp.	0	0	0	0	0	0
	Microtendipes pedellus gr.	1	0	3	0	2	1
	Microtendipes rydalensis gr.	*0*	*0*	*0*	*0*	*0*	*0*
	Nanocladius sp.	0	0	0	0	0	0
	Neozavrelia sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Nilotanypus fimbriatus	*0*	*0*	*0*	*0*	*0*	*0*
	Nilotanypus sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Orthocladiinae	0	0	0	0	0	0
	Orthocladius (Euortho.) rivicola gr.	0	0	0	0	0	0
	Orthocladius (Euorthocladius) sp.	0	2	4	1	0	3
	Orthocladius Complex	1	2	1	2	0	0
	Orthocladius annectens	0	0	2	0	4	0
	Orthocladius sp.	0	1	3	2	0	0
	Parakiefferiella sp.	0	0	1	0	0	0
	Parametriocnemus sp.	0	1	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0
	Paratendipes sp.	0	0	0	0	0	0
	Phaenopsectra sp.	0	0	0	0	0	0
	Polypedilum aviceps	13	38	4	9	1	2
	Polypedilum flavum	*0*	*0*	*0*	*0*	*0*	*0*
	Polypedilum illinoense gr.	*0*	*0*	*0*	*0*	*0*	*0*
	Polypedilum ontario	*0*	*0*	*0*	*0*	*0*	*0*
	Polypedilum sp.	0	0	1	0	0	0
	Polypedilum tritum	0	0	0	0	0	0
	Potthastia gaedii gr.	0	0	0	0	0	0
	Potthastia longimana gr.	*0*	*0*	*0*	*0*	*0*	*0*
	Procladius sp.	1	0	2	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Taxa							
Data are NOT adjusted for subsampling							
	Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
	EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
	Rheocricotopus sp.	0	0	1	0	0	1
	Rheotanytarsus exiguus gr.	2	2	2	6	8	8
	Rheotanytarsus pellucidus gr.	0	3	3	0	0	0
	Stempellina sp.	0	0	1	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0
	Stilocladius sp.	11	15	2	6	2	2
	Sublettea sp.	0	0	2	0	0	0
	Synorthocladius sp.	0	0	1	0	1	0
	Tanytarsini	0	0	0	0	0	0
	Tanytarsus sp.	0	5	10	0	1	0
	Thienemanniella sp.	0	1	0	0	2	1
	Thienemannimyia gr. sp.	0	7	1	0	0	1
	Tvetenia bavarica gr.	4	2	0	2	0	1
	Tvetenia discoloripes gr.	0	0	1	7	1	5
	Xenochironomus xenolabis	*0*	*0*	*0*	*0*	*0*	*0*
Diptera	*Antocha* sp.	1	2	1	1	0	0
	Atherix sp.	0	0	0	0	0	0
	Atrichopogon sp.	0	0	0	0	1	0
	Ceratopogoninae	*0*	*0*	*0*	*0*	*0*	*0*
	Empididae	2	2	0	0	0	1
	Ephydridae	0	0	0	0	0	0
	Forcipomyia sp.	0	0	0	0	1	0
	Hemerodromia sp.	2	10	5	4	7	6
	Limonia sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Muscidae	*0*	*0*	*0*	*0*	*0*	*0*
	Pericoma/Telmatoscopus sp.	2	0	0	0	0	0
	Psychodidae	0	1	0	0	0	0
	Sciomyzidae	0	0	0	0	0	0
	Simulium sp.	21	11	6	14	7	17
	Stilobezzia sp.	1	0	0	0	0	0
	Tipula sp.	2	1	0	1	0	0
	Tipulidae	0	0	0	0	0	0
Trichoptera	*Apatania* sp.	0	1	12	9	5	0
	Brachycentrus appalachia	*0*	*0*	*0*	*0*	*0*	*0*
	Brachycentrus numerosus	0	0	0	0	0	0
	Ceraclea sp.	0	1	0	0	0	0
	Cheumatopsyche sp.	36	34	5	58	5	19
	Chimarra aterrima	62	51	7	31	3	86
	Chimarra obscura	*0*	*0*	*0*	*0*	*0*	*0*
	Chimarra socia	*0*	*0*	*0*	*0*	*0*	*0*
	Chimarra sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Culoptila sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Diplectrona sp.	4	0	0	0	0	0
	Dolophilodes sp.	14	5	1	5	0	6
	Glossosoma sp.	0	0	0	0	0	0
	Goera sp.	0	0	0	0	0	0

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Taxa							
Data are NOT adjusted for subsampling							
	Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
	EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
	Hydropsyche betteni	21	27	1	7	0	17
	Helicopsyche borealis	*0*	*0*	*0*	*0*	*0*	*0*
	Hydropsyche bronta	0	0	1	1	0	1
	Hydropsyche leonardi	*0*	*0*	*0*	*0*	*0*	*0*
	Hydropsyche morosa	0	0	17	48	0	2
	Hydropsyche scalaris	*0*	*0*	*0*	*0*	*0*	*0*
	Hydropsyche slossonae	0	1	0	0	0	2
	Hydropsyche sp.	3	1	0	0	2	0
	Hydropsyche sparna	0	0	3	6	0	15
	Hydroptila sp.	0	0	2	0	6	0
	Leptoceridae	*0*	*0*	*0*	*0*	*0*	*0*
	Lepidostoma sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Leucotrichia pictipes	1	0	0	0	0	0
	Limnephilidae	0	0	1	0	0	0
	Lype diversa	0	0	0	0	0	0
	Macrostemum sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Micrasema sp.	0	0	7	0	4	0
	Mystacides sepulchralis	5	0	3	1	0	0
	Neophylax fuscus	*0*	*0*	*0*	*0*	*0*	*0*
	Neureclipsis sp.	0	0	0	0	0	0
	Nyctiophylax sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Oecetis furva gr.	*0*	*0*	*0*	*0*	*0*	*0*
	Oecetis persimilis	0	0	0	0	0	0
	Oecetis sp.	1	0	0	0	0	0
	Phylocentropus sp.	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0
	Polycentropus sp.	2	1	0	0	2	0
	Protoptila sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Psychomyia flavida	0	0	1	0	0	0
	Psychomyia nomada	0	0	0	0	0	0
	Pycnopsyche sp.	0	0	0	0	0	0
	Rhyacophila formosa	*0*	*0*	*0*	*0*	*0*	*0*
	Rhyacophila fuscula	0	0	0	0	0	1
	Rhyacophila mainensis	0	0	0	0	0	0
	Rhyacophila minora	0	1	0	0	0	0
	Rhyacophila sp.	2	4	0	0	0	0
	Petrophila sp.	*0*	*0*	*0*	*0*	*0*	*0*
Gastropoda	*Amnicola* sp.	0	0	0	0	0	0
	Ancylidae	0	0	0	0	0	0
	Ferrissia sp.	10	5	4	0	5	0
	Fossaria sp.	0	0	0	0	7	1
	Gyraulus sp.	0	0	0	0	0	0
	Helisoma anceps	*0*	*0*	*0*	*0*	*0*	*0*
	Hydrobiidae	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0
	Micromenetus sp.	1	0	3	0	3	1

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Taxa							
Data are NOT adjusted for subsampling							
	Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
	EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
	Physa sp.	3	1	12	1	7	1
	Planorbidae	0	0	0	1	0	0
Bivalvia	*Pisidium* sp.	4	0	0	0	4	0
	Sphaeriidae	0	0	3	0	0	0
	Sphaerium sp.	0	0	0	0	0	0
Annelida	*Aulodrilus limnobius*	0	0	0	0	1	0
	Dero furcata	0	0	0	0	0	0
	Enchytraeidae	3	1	1	0	0	0
	Erpobdellidae	*0*	*0*	*0*	*0*	*0*	*0*
	Glossiphoniidae	*0*	*0*	*0*	*0*	*0*	*0*
	Helobdella elongata	*0*	*0*	*0*	*0*	*0*	*0*
	Lumbricina	0	0	0	1	1	1
	Lumbriculidae	3	0	3	0	13	3
	Manayunkia speciosa	*0*	*0*	*0*	*0*	*0*	*0*
	Nais behningi	*0*	*0*	*0*	*0*	*0*	*0*
	Nais bretscheri	0	1	0	0	0	0
	Nais communis	0	0	1	0	1	0
	Nais simplex	0	2	0	0	0	0
	Nais sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Nais variabilis	0	0	0	0	0	0
	Pristina jenkinae	1	0	0	0	0	0
	Pristina osborni	0	0	1	0	0	0
	Tubificidae w/ cap setae	1	0	1	0	0	0
	Tubificidae w/o cap setae	0	0	2	0	2	0
Acari	Acari	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	1
	Aturus sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Clathrosperchon sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Hygrobates sp.	2	0	9	1	5	0
	Lebertia sp.	2	1	3	0	6	1
	Limnesia sp.	0	0	0	0	0	0
	Mideopsis sp.	0	0	1	0	1	0
	Neumania sp.	0	0	0	0	1	0
	Oribatei	1	0	0	0	0	0
	Protzia sp.	0	0	0	0	0	0
	Sperchon sp.	1	2	10	5	3	3
	Sperchonopsis sp.	2	2	1	0	0	0
	Torrenticola sp.	0	2	1	0	0	0
Crustacea	*Caecidotea* sp.	1	0	0	0	0	0
	Cambarus bartonii	0	0	1	0	0	0
	Cambarus sp.	0	0	0	0	0	0
	Crangonyx sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Gammarus sp.	*0*	*0*	*0*	*0*	*0*	*0*
	Hyalella sp.	0	0	0	0	0	0
	Orconectes sp.	0	0	0	0	0	0

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Taxa							
Data are NOT adjusted for subsampling							
	Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
	EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
	Ostracoda	0	0	0	0	0	0
	Stygobromus sp.	0	0	0	0	0	0
Other Organisms	Nematoda	3	0	1	0	0	0
	Prostoma sp.	4	10	0	1	1	3
	Turbellaria	5	3	2	4	0	0
	TOTAL	**371**	**326**	**307**	**319**	**320**	**309**

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Metrics						
Data are adjusted for subsampling						
Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
Abundance Measures						
Corrected Abundance	2021.95	1304.00	1842.00	1276.00	1180.80	309.00
EPT Abundance	1253.50	640.00	762.00	916.00	571.95	217.00
Dominance Measures						
Dominant Taxon	*Chimarra aterrima*	*Chimarra aterrima*	*Eurylophella* sp.	*Cheumatopsyche* sp.	*Eurylophella* sp.	*Chimarra aterrima*
Dominant Abundance	337.90	204.00	126.00	232.00	162.36	86.00
2nd Dominant Taxon	*Cheumatopsyche* sp.	*Polypedilum aviceps*	*Optioservus trivittatus*	*Hydropsyche morosa*	*Isonychia* sp.	*Isonychia* sp.
2nd Dominant Abundance	196.20	152.00	114.00	192.00	88.56	31.00
3rd Dominant Taxon	*Eurylophella* sp.	*Cheumatopsyche* sp.	*Dubiraphia* sp.	*Chimarra aterrima*	*Optioservus ovalis*	*Cheumatopsyche* sp.
3rd Dominant Abundance	196.20	136.00	102.00	124.00	70.11	19.00
% Dominant Taxon	16.71	15.64	6.84	18.18	13.75	27.83
% 2 Dominant Taxa	26.42	27.30	13.03	33.23	21.25	37.86
% 3 Dominant Taxa	36.12	37.73	18.57	42.95	27.19	44.01
Richness Measures						
Species Richness	70.00	64.00	82.00	49.00	65.00	54.00
EPT Richness	23.00	20.00	27.00	21.00	17.00	23.00
Ephemeroptera Richness	8.00	7.00	11.00	6.00	7.00	8.00
Plecoptera Richness	4.00	2.00	3.00	6.00	3.00	6.00
Trichoptera Richness	11.00	11.00	13.00	9.00	7.00	9.00
Chironomidae Richness	16.00	18.00	24.00	10.00	12.00	12.00
Oligochaeta Richness	4.00	3.00	6.00	1.00	5.00	2.00
Non-Chiro. Non-Olig. Richness	50.00	43.00	52.00	38.00	48.00	40.00
Rhyacophila Richness	1.00	2.00	0.00	0.00	0.00	1.00
Community Composition						
% Ephemeroptera	19.41	9.20	19.54	15.99	32.81	16.83
% Plecoptera	1.89	0.92	1.95	3.76	7.19	5.18
% Trichoptera	40.70	38.96	19.87	52.04	8.44	48.22
% EPT	61.99	49.08	41.37	71.79	48.44	70.23
% Coleoptera	1.89	4.60	14.01	5.33	13.44	6.15
% Diptera	22.10	35.89	23.13	17.87	13.75	17.80
% Oligochaeta	2.16	1.23	2.93	0.31	5.63	1.29
% Baetidae	6.47	2.76	3.26	3.13	0.31	0.97
% Brachycentridae	0.00	0.00	2.28	0.00	1.25	0.00
% Chironomidae	13.75	27.61	19.22	11.60	8.75	10.03
% Ephemerellidae	9.97	4.60	6.84	1.25	13.75	1.29
% Hydropsychidae	17.25	19.33	8.79	37.62	2.19	18.12
% Odonata	1.08	0.92	1.30	0.63	4.69	0.65
% Perlidae	0.54	0.61	0.00	0.94	1.25	2.59
% Pteronarcyidae	0.27	0.00	0.00	0.00	0.00	0.00

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Metrics						
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Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
% Simuliidae	5.66	3.37	1.95	4.39	2.19	5.50
Functional Group Composition						
% Filterers	45.28	43.25	23.78	61.76	17.50	66.34
% Gatherers	30.46	20.86	30.94	12.23	34.38	9.39
% Predators	11.05	15.95	13.36	6.58	14.69	9.71
% Scrapers	6.74	5.52	20.52	12.85	20.94	7.44
% Shredders	5.66	12.88	6.84	6.27	9.06	3.24
% Piercer-Herbivores	0.27	0.00	0.98	0.00	1.88	0.00
% Unclassified	0.27	1.53	2.61	0.31	0.63	3.56
Filterer Richness	10.00	11.00	15.00	10.00	9.00	12.00
Gatherer Richness	26.00	23.00	29.00	15.00	18.00	14.00
Predator Richness	20.00	17.00	14.00	9.00	17.00	15.00
Scraper Richness	5.00	7.00	9.00	7.00	11.00	6.00
Shredder Richness	6.00	4.00	8.00	7.00	7.00	4.00
Piercer-Herbivore Richness	1.00	0.00	2.00	0.00	1.00	0.00
Unclassified	1.00	2.00	4.00	1.00	1.00	2.00
Diversity/Evenness Measures						
Shannon-Weaver H' (log 10)	1.48	1.43	1.70	1.33	1.57	1.30
Shannon-Weaver H' (log 2)	4.91	4.76	5.63	4.41	5.22	4.33
Shannon-Weaver H' (log e)	3.40	3.30	3.91	3.05	3.62	3.00
Margalef's Richness	9.06	8.78	10.77	6.71	9.05	9.24
Pielou's J'	0.80	0.79	0.89	0.78	0.87	0.75
Simpson's Heterogeneity	0.94	0.93	0.97	0.92	0.96	0.90
Biotic Indices						
% Indiv. w/ HBI Value	96.23	96.63	88.27	97.81	91.56	94.17
Hilsenhoff Biotic Index	4.51	4.94	4.72	4.46	4.20	4.27
% Indiv. w/ MTI Value	42.32	37.73	44.63	57.99	36.25	25.57
Metals Tolerance Index	3.80	3.81	3.44	4.33	2.88	3.89
% Indiv. w/ FSBI Value	25.88	23.01	15.64	34.17	11.25	17.15
Fine Sediment Biotic Index	59.00	59.00	48.00	49.00	31.00	44.00
FSBI - average	0.84	0.92	0.59	1.00	0.48	0.81
FSBI - weighted average	3.44	3.36	4.73	3.22	4.36	3.25
% Indiv. w/ TPM Value	33.96	39.57	33.88	37.30	25.94	21.36
Temp. Pref. Metric - average	1.10	1.22	1.00	1.16	0.92	1.09
TPM - weighted average	3.39	2.58	3.24	2.87	3.45	3.50
Karr BIBI Metrics						
Long-Lived Taxa Richness	6.00	4.00	6.00	6.00	6.00	3.00
Clinger Richness	31.00	27.00	36.00	26.00	28.00	26.00
% Clingers	57.14	44.48	56.35	65.52	51.25	43.69
Intolerant Taxa Richness	11.00	11.00	12.00	14.00	14.00	10.00
% Tolerant Individuals	0.87	1.11	1.35	0.24	2.40	2.75

Palmerton Benthos - 2006 Mill Creek and Buckwha Creek Metrics						
Data are adjusted for subsampling						
Site ID	**MC01**	**MC01**	**BC09**	**BC09**	**BC10**	**BC10**
Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**	**10-09-2006**
Percent Subsampled	**18.35**	**25.00**	**16.67**	**25.00**	**27.10**	**100.00**
EcoAnalysts Sample ID	**888-2**	**888-1**	**888-6**	**888-5**	**888-4**	**888-3**
% Tolerant Taxa	17.14	10.94	13.41	6.12	12.31	7.41
Coleoptera Richness	4.00	6.00	5.00	6.00	8.00	4.00

Palmerton Benthos 2006 Aquashicola Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**AC07**	**AC07**	**AC08**	**AC08**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
Ephemeroptera	*Acentrella turbida*	0	0	0	1	0	0	3	5	2	0	1	1	0	0
	Baetis flavistriga	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Baetis intercalaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Baetis pluto	0	0	0	0	0	0	0	0	0	0	0	2	2	0
	Baetis sp.	0	0	0	0	0	0	0	0	0	0	2	2	0	3
	Baetis tricaudatus	0	0	1	0	0	1	1	0	1	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	8	0	4	0	3	0	1	0
	Centroptilum sp.	0	0	0	0	0	0	3	0	2	0	0	0	0	0
	Epeorus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ephemerella invaria	0	0	0	0	0	0	3	0	3	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0	0	0	2	1	4	4	3
	Ephemerellidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eurylophella sp.	0	0	0	0	0	0	3	0	9	0	5	2	8	5
	Heptageniidae	0	0	0	0	0	0	0	0	1	0	0	0	1	0
	Heterocloeon sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Isonychia sp.	0	0	0	0	2	0	8	20	28	17	1	10	7	15
	Leptophlebiidae	0	0	0	0	0	0	0	0	1	0	0	0	3	0
	Leucrocuta sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium ithaca	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium mediopunctatum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium modestum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium pulchellum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Maccaffertium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Plauditus sp.	0	0	1	0	2	1	3	0	0	1	0	3	9	2
	Procloeon sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pseudocloeon propinquum	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	Serratella deficiens	0	0	0	0	0	0	0	0	0	0	2	1	4	1
	Serratella serrata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2006 Aquashicola Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**AC07**	**AC07**	**AC08**	**AC08**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Serratella serratoides	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stenacron interpunctatum	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Stenonema modestum	0	0	0	0	1	0	0	0	0	0	0	0	0	23
	Stenonema sp.	0	0	0	0	0	0	1	0	3	2	1	4	9	0
	Tricorythodes sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Odonata	*Argia* sp.	50	0	7	0	3	0	1	0	0	0	2	0	0	0
	Boyeria sp.	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Boyeria vinosa	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Calopterygidae	0	0	0	0	0	0	0	0	0	0	0	1	1	0
	Calopteryx sp.	0	0	0	0	0	0	0	0	0	0	6	0	0	0
	Coenagrion/Enallagma sp.	20	0	0	0	8	0	0	0	0	0	0	0	0	0
	Coenagrionidae	0	0	0	0	0	0	3	0	5	0	2	0	0	0
	Gomphidae	0	0	1	0	0	0	0	0	1	0	1	0	2	0
	Gomphus sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Hagenius brevistylus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Libellulidae	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Macromia illinoiensis	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	Macromia sp.	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Macromiinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ophiogomphus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stylogomphus albistylus	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Plecoptera	*Acroneuria abnormis*	0	0	0	1	0	2	0	0	0	1	0	0	1	2
	Acroneuria sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Capniidae	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	Leuctra sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Paragnetina immarginata	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Paragnetina media	0	0	0	0	0	1	0	1	1	4	1	0	0	0
	Paragnetina sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Palmerton Benthos 2006 Aquashicola Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**AC07**	**AC07**	**AC08**	**AC08**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Perlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Perlodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pteronarcys sp.	0	0	0	0	0	0	0	0	0	1	0	0	2	1
	Sweltsa sp.	1	0	0	0	0	0	0	1	0	0	0	0	0	0
	Taeniopteryx sp.	0	5	5	0	12	9	7	4	7	3	5	19	12	15
	Tallaperla sp.	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Hemiptera	Corixidae	0	0	0	0	0	0	0	0	0	0	1	0	7	0
	Neoplea sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Coleoptera	*Berosus* sp.	6	0	2	0	2	0	0	0	0	0	1	0	0	0
	Dubiraphia sp.	1	0	2	0	7	0	2	0	4	0	38	0	10	2
	Ectopria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Helichus sp.	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	Hydrophilidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Laccobius sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Macronychus glabratus	0	0	0	0	2	0	0	0	0	2	3	0	0	2
	Microcylloepus sp.	0	0	0	0	0	0	0	0	1	0	2	0	0	0
	Optioservus ovalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Optioservus sp.	0	0	0	0	0	0	10	0	7	0	10	1	0	0
	Optioservus trivittatus	0	2	1	3	10	3	0	52	0	7	0	0	17	58
	Oulimnius latiusculus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oulimnius nitidulus	0	0	0	0	0	2	3	6	2	0	2	2	6	14
	Oulimnius sp.	0	2	1	0	0	0	0	0	0	0	0	0	0	0
	Peltodytes sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Promoresia tardella	0	0	0	0	4	3	2	1	6	9	4	12	10	13
	Psephenus herricki	1	2	0	0	0	0	4	3	0	2	1	0	0	1
	Stenelmis sp.	0	0	0	3	0	0	0	3	1	3	1	1	2	5
Megaloptera	Corydalidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Corydalus cornutus	0	0	0	0	0	0	0	0	0	2	0	0	0	0

Palmerton Benthos 2006 Aquashicola Creek Taxa															
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	Site ID	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**AC07**	**AC07**	**AC08**	**AC08**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Nigronia serricornis	1	0	0	0	0	0	1	0	0	8	0	1	2	6
	Sialis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diptera-Chironomidae	*Ablabesmyia mallochi*	0	0	0	0	0	0	0	0	2	0	1	0	0	0
	Brillia sp.	0	0	1	1	0	0	0	0	0	0	0	1	0	0
	Cardiocladius sp.	4	3	1	10	0	0	0	0	0	0	0	0	0	0
	Chironomini	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Chironomus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Cladotanytarsus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cricotopus bicinctus gr.	9	8	30	9	14	9	9	0	5	0	4	0	7	0
	Cricotopus sp.	0	0	1	5	5	0	0	0	1	0	1	2	1	0
	Cricotopus trifascia gr.	0	0	1	0	0	0	2	0	0	1	0	0	0	0
	Cryptochironomus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Diamesa sp.	0	2	0	13	0	0	0	0	0	0	0	0	0	0
	Dicrotendipes modestus	42	2	4	0	8	0	16	0	4	0	3	1	4	0
	Dicrotendipes sp.	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	Diplocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Eukiefferiella devonica gr.	0	1	1	4	1	5	0	0	0	0	0	8	0	0
	Eukiefferiella pseudomontana gr.	0	0	0	0	0	0	0	0	0	0	3	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0	0	0	1	1	0	0	0
	Eukiefferiella tirolensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gymnometriocnemus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Limnophyes sp.	0	1	0	0	0	0	0	0	0	0	0	0	1	0
	Micropsectra sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Micropsectra/Tanytarsus sp.	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	1	0	3	0	1	0	1	0	1	6

Palmerton Benthos 2006 Aquashicola Creek Taxa

Data are NOT adjusted for subsampling

	Site ID	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**AC07**	**AC07**	**AC08**	**AC08**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Microtendipes rydalensis gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nanocladius sp.	0	0	0	0	0	0	0	0	2	1	1	0	1	0
	Neozavrelia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nilotanypus fimbriatus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nilotanypus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Orthocladiinae	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Orthocladius (Euortho.) rivicola gr.	0	0	0	0	0	0	0	0	0	0	0	7	0	0
	Orthocladius (Euorthocladius) sp.	1	0	0	5	1	3	1	4	1	4	0	0	0	0
	Orthocladius Complex	0	0	8	7	5	12	4	0	0	0	4	7	2	7
	Orthocladius annectens	4	3	15	2	30	4	8	0	4	1	4	4	11	0
	Orthocladius sp.	15	20	11	14	30	22	7	22	15	2	6	15	6	2
	Parakiefferiella sp.	0	0	0	0	0	0	3	0	0	0	2	0	3	4
	Parametriocnemus sp.	0	0	0	0	0	1	0	0	0	1	1	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Paratendipes sp.	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Phaenopsectra sp.	1	1	1	0	0	0	0	0	0	0	1	0	0	0
	Polypedilum aviceps	0	0	0	0	0	0	0	0	6	0	0	4	0	0
	Polypedilum flavum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Polypedilum illinoense gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Polypedilum ontario	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Polypedilum sp.	0	0	0	0	0	0	2	0	0	0	1	0	1	1
	Polypedilum tritum	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Potthastia gaedii gr.	1	1	7	0	0	0	0	0	0	0	0	0	0	1
	Potthastia longimana gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Procladius sp.	4	0	0	0	0	0	0	0	0	0	4	0	0	0
	Psectrocladius sp.	0	0	0	0	3	0	2	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rheotanytarsus exiguus	0	0	0	0	0	1	2	0	2	1	4	16	5	11

Palmerton Benthos 2006 Aquashicola Creek Taxa															
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	Site ID	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**AC07**	**AC07**	**AC08**	**AC08**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	gr.														
	Rheotanytarsus pellucidus gr.	0	0	0	0	0	0	0	0	2	0	1	1	5	4
	Stempellina sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	1	0	1	0	2	0	0	0	1	0	0	1
	Stilocladius sp.	3	5	10	2	2	9	3	0	0	1	0	1	1	0
	Sublettea sp.	0	0	0	0	0	0	0	1	0	0	0	0	0	2
	Synorthocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Tanytarsus sp.	0	0	0	0	0	0	7	0	0	1	2	2	3	3
	Thienemanniella sp.	0	0	0	0	0	0	0	0	1	0	1	1	0	0
	Thienemannimyia gr. sp.	0	1	1	0	0	0	0	0	0	0	0	0	0	2
	Tvetenia bavarica gr.	1	0	0	0	0	0	0	0	1	3	5	10	3	0
	Tvetenia discoloripes gr.	0	0	0	1	0	1	0	1	3	4	3	1	0	0
	Xenochironomus xenolabis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Diptera	*Antocha* sp.	0	1	0	0	0	0	0	0	0	0	1	4	3	11
	Atherix sp.	0	1	0	0	0	0	0	0	1	0	0	0	0	0
	Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ceratopogoninae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Empididae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ephydridae	0	0	0	0	0	0	0	0	0	0	0	0	3	0
	Forcipomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hemerodromia sp.	9	25	18	6	41	22	15	27	4	3	15	6	1	5
	Limonia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Muscidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pericoma/Telmatoscopus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Sciomyzidae	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Simulium sp.	13	36	15	18	8	30	8	5	16	20	14	37	2	0

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	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Stilobezzia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tipula sp.	1	0	0	0	0	0	0	0	1	2	1	0	0	0
	Tipulidae	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera	*Apatania* sp.	10	5	21	7	9	2	13	11	22	1	4	5	6	22
	Brachycentrus appalachia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Brachycentrus numerosus	0	0	0	0	0	0	0	0	0	0	0	0	11	0
	Ceraclea sp.	0	0	0	1	2	0	0	0	0	0	0	0	0	0
	Cheumatopsyche sp.	11	136	39	105	11	82	9	51	23	50	10	18	17	14
	Chimarra aterrima	0	0	0	0	0	0	1	1	4	6	1	8	9	2
	Chimarra obscura	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Chimarra socia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Chimarra sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Culoptila sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Diplectrona sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dolophilodes sp.	0	0	1	1	0	0	0	0	0	0	0	2	0	0
	Glossosoma sp.	0	0	1	0	0	0	0	0	0	1	0	0	0	4
	Goera sp.	0	0	0	0	0	0	0	0	0	0	0	0	2	5
	Hydropsyche betteni	0	3	0	0	0	17	0	6	18	49	23	15	3	2
	Helicopsyche borealis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Hydropsyche bronta	1	0	0	0	0	0	0	0	0	10	0	10	0	5
	Hydropsyche leonardi	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Hydropsyche morosa	9	42	51	135	20	82	7	81	53	47	15	15	0	5
	Hydropsyche scalaris	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Hydropsyche slossonae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	3	0	0	0	0	0	9	0
	Hydropsyche sparna	0	0	0	0	1	5	0	0	6	17	10	18	5	2
	Hydroptila sp.	1	0	4	0	4	1	6	1	2	0	1	0	2	3
	Leptoceridae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2006 Aquashicola Creek Taxa

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	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	AC07	AC07	AC08	AC08
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Lepidostoma sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Leucotrichia pictipes	0	0	0	0	0	0	1	9	1	0	1	11	0	1
	Limnephilidae	0	2	0	0	2	0	0	0	0	0	0	0	2	0
	Lype diversa	0	0	0	0	0	0	0	0	0	0	0	0	2	4
	Macrostemum sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Micrasema sp.	2	2	24	7	16	27	5	2	1	2	4	2	1	0
	Mystacides sepulchralis	2	0	4	0	9	1	8	0	0	0	4	0	3	1
	Neophylax fuscus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Neureclipsis sp.	1	2	15	2	1	6	0	0	0	0	0	0	0	0
	Nyctiophylax sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Oecetis furva gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Oecetis persimilis	0	0	0	0	6	0	0	0	0	0	0	0	0	0
	Oecetis sp.	0	0	2	0	0	0	0	0	0	0	0	0	0	1
	Phylocentropus sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Polycentropodidae	0	0	0	0	1	0	0	0	0	0	1	0	2	0
	Polycentropus sp.	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	Protoptila sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Psychomyia flavida	0	0	0	0	1	0	0	2	2	1	1	0	0	0
	Psychomyia nomada	0	0	0	0	0	0	0	0	1	0	0	0	2	5
	Pycnopsyche sp.	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhyacophila formosa	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Rhyacophila fuscula	0	0	0	0	0	1	0	1	2	0	0	5	0	0
	Rhyacophila mainensis	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Rhyacophila minora	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhyacophila sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Petrophila sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Gastropoda	*Amnicola* sp.	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Ancylidae	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Ferrissia sp.	0	0	0	0	1	0	3	0	0	0	2	1	0	2

Palmerton Benthos 2006 Aquashicola Creek Taxa

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	Site ID	AC01	AC01	AC02/03	AC02/03	AC04	AC04	AC05	AC05	AC06	AC06	AC07	AC07	AC08	AC08
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Fossaria sp.	0	0	0	0	0	0	0	0	2	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	6	0	0	0	0	0	0	0
	Helisoma anceps	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Hydrobiidae	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0	0	0	1	2	0	0	0
	Micromenetus sp.	0	0	0	0	0	0	4	0	5	0	0	0	0	0
	Physa sp.	40	0	4	1	0	0	8	1	5	0	2	0	3	0
	Planorbidae	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Bivalvia	*Pisidium* sp.	13	0	0	0	5	0	0	0	0	0	7	0	0	2
	Sphaeriidae	0	0	0	0	0	0	5	0	1	0	0	0	0	0
	Sphaerium sp.	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Annelida	*Aulodrilus limnobius*	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Dero furcata	0	3	0	0	0	0	0	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Erpobdellidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Glossiphoniidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Helobdella elongata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Lumbricina	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lumbriculidae	4	0	0	0	0	0	0	0	0	0	0	0	1	0
	Manayunkia speciosa	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nais behningi	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nais bretscheri	0	0	0	0	0	0	2	0	0	0	0	0	0	0
	Nais communis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nais simplex	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nais sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nais variabilis	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pristina jenkinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pristina osborni	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tubificidae w/ cap setae	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Palmerton Benthos 2006 Aquashicola Creek Taxa															
Data are NOT adjusted for subsampling															
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	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
	Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
	EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
	Tubificidae w/o cap setae	3	0	0	0	0	0	0	0	0	0	0	0	1	0
Acari	Acari	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Aturus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Clathrosperchon sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Hygrobates sp.	0	0	0	0	6	0	29	1	4	1	9	7	19	5
	Lebertia sp.	1	1	2	0	1	0	1	2	1	0	6	0	5	17
	Limnesia sp.	0	0	0	0	0	0	0	0	0	0	2	0	0	4
	Mideopsis sp.	5	0	1	0	5	1	1	0	1	0	3	0	0	1
	Neumania sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Protzia sp.	0	0	0	0	0	0	0	0	1	1	0	0	0	0
	Sperchon sp.	2	3	6	12	2	15	4	11	9	3	4	5	4	31
	Sperchonopsis sp.	0	0	0	0	3	0	1	1	2	1	2	1	3	0
	Torrenticola sp.	0	0	0	0	4	0	8	1	3	1	1	0	0	2
Crustacea	*Caecidotea* sp.	1	0	0	0	1	0	5	0	3	0	0	0	1	0
	Cambarus bartonii	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cambarus sp.	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Crangonyx sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Gammarus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Hyalella sp.	0	0	0	0	0	0	12	0	1	0	4	0	5	0
	Orconectes sp.	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Ostracoda	0	0	0	0	0	0	1	0	0	0	5	0	0	0
	Stygobromus sp.	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Other Organisms	Nematoda	1	2	0	2	0	0	1	1	0	1	1	1	1	2
	Prostoma sp.	5	6	2	1	5	0	1	1	0	4	12	2	1	7
	Turbellaria	6	5	7	6	3	4	6	0	3	0	1	0	0	0
	TOTAL	**317**	**336**	**334**	**386**	**324**	**386**	**316**	**341**	**340**	**310**	**325**	**325**	**312**	**382**

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Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
Abundance Measures														
Corrected Abundance	802.01	672.00	2004.00	1323.98	706.32	9264.00	3371.72	1486.76	1254.60	3720.00	1114.75	4455.75	1248.00	1019.94
EPT Abundance	98.67	394.00	1014.00	891.80	218.00	5712.00	1013.65	854.56	730.62	2592.00	336.14	2179.89	564.00	395.16
Dominance Measures														
Dominant Taxon	*Argia* sp.	*Cheumatopsyche* sp.	*Hydropsyche morosa*	*Hydropsyche morosa*	*Hemerodromia* sp.	*Hydropsyche morosa*	*Hygrobates* sp.	*Hydropsyche morosa*	*Hydropsyche morosa*	*Cheumatopsyche* sp.	*Dubiraphia* sp.	*Simulium* sp.	*Hygrobates* sp.	*Optioservus trivittatus*
Dominant Abundance	126.50	272.00	306.00	463.05	89.38	1968.00	309.43	353.16	195.57	600.00	130.34	507.27	76.00	154.86
2nd Dominant Taxon	*Dicrotendipes modestus*	*Hydropsyche morosa*	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.	*Orthocladius annectens*	*Cheumatopsyche* sp.	*Dicrotendipes modestus*	*Optioservus trivittatus*	*Isonychia* sp.	*Hydropsyche betteni*	*Hydropsyche betteni*	*Taeniopteryx* sp.	*Cheumatopsyche* sp.	*Sperchon* sp.
2nd Dominant Abundance	106.26	84.00	234.00	360.15	65.40	1968.00	170.72	226.72	103.32	588.00	78.89	260.49	68.00	82.77
3rd Dominant Taxon	*Physa sp.*	*Simulium* sp.	*Cricotopus bicinctus* gr.	*Simulium* sp.	*Orthocladius* sp.	*Simulium* sp.	*Hemerodromia* sp.	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.	*Hydropsyche morosa*	*Hemerodromia* sp.	*Cheumatopsyche* sp.	*Optioservus trivittatus*	*Stenonema modestum*
3rd Dominant Abundance	101.20	72.00	180.00	61.74	65.40	720.00	160.05	222.36	84.87	564.00	51.45	246.78	68.00	61.41
% Dominant Taxon	15.77	40.48	15.27	34.97	12.65	21.24	9.18	23.75	15.59	16.13	11.69	11.38	6.09	15.18
% 2 Dominant Taxa	29.02	52.98	26.95	62.18	21.91	42.49	14.24	39.00	23.82	31.94	18.77	17.23	11.54	23.30
% 3 Dominant Taxa	41.64	63.69	35.93	66.84	31.17	50.26	18.99	53.96	30.59	47.10	23.38	22.77	16.99	29.32
Richness Measures														
Species Richness	48.00	35.00	45.00	31.00	51.00	34.00	67.00	35.00	68.00	51.00	84.00	57.00	75.00	59.00
EPT Richness	10.00	8.00	13.00	9.00	17.00	15.00	21.00	15.00	25.00	19.00	23.00	23.00	29.00	27.00
Ephemeroptera Richness	0.00	0.00	2.00	1.00	3.00	2.00	11.00	2.00	10.00	4.00	8.00	9.00	11.00	7.00
Plecoptera Richness	1.00	1.00	1.00	1.00	1.00	3.00	1.00	3.00	2.00	5.00	2.00	2.00	3.00	5.00
Trichoptera Richness	9.00	7.00	10.00	7.00	13.00	10.00	9.00	10.00	13.00	10.00	13.00	12.00	15.00	15.00
Chironomidae Richness	12.00	12.00	16.00	13.00	12.00	10.00	15.00	4.00	15.00	13.00	25.00	17.00	18.00	12.00
Oligochaeta Richness	5.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
Non-Chiro. Non-Olig. Richness	31.00	22.00	29.00	18.00	38.00	24.00	51.00	31.00	53.00	38.00	59.00	40.00	54.00	47.00

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Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
Rhyacophila Richness	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	2.00	0.00	0.00
Community Composition														
% Ephemeroptera	0.00	0.00	0.60	0.26	1.54	0.52	11.08	7.33	15.88	7.10	4.92	8.92	16.03	13.61
% Plecoptera	0.32	1.49	1.50	0.26	3.70	3.11	2.22	1.76	2.35	3.23	1.85	6.15	4.81	5.24
% Trichoptera	11.99	57.14	48.50	66.84	25.62	58.03	16.77	48.39	40.00	59.35	23.38	33.85	24.36	19.90
% EPT	12.30	58.63	50.60	67.36	30.86	61.66	30.06	57.48	58.24	69.68	30.15	48.92	45.19	38.74
% Coleoptera	2.52	1.79	1.80	1.55	7.72	2.07	6.65	19.06	6.47	7.42	19.08	4.92	14.42	24.87
% Diptera	34.38	33.33	38.02	25.39	46.30	30.83	29.75	17.60	21.18	15.16	27.08	40.00	21.47	15.71
% Oligochaeta	3.15	0.89	0.00	0.00	0.31	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.96	0.00
% Baetidae	0.00	0.00	0.60	0.26	0.62	0.52	3.48	1.47	1.47	0.32	0.92	2.46	4.17	1.31
% Brachycentridae	0.63	0.60	7.19	1.81	4.94	6.99	1.58	0.59	0.29	0.65	1.23	0.62	3.85	0.00
% Chironomidae	27.13	14.29	28.14	19.17	31.17	17.36	22.47	8.21	14.71	7.10	17.54	25.23	18.27	11.52
% Ephemerellidae	0.00	0.00	0.00	0.00	0.00	0.00	1.90	0.00	3.53	0.65	2.46	2.15	5.13	2.36
% Hydropsychidae	6.62	53.87	26.95	62.18	9.88	48.19	6.01	40.47	29.41	55.81	17.85	23.38	10.90	7.33
% Odonata	23.34	0.30	2.69	0.00	3.40	0.26	1.58	0.00	1.76	0.00	4.00	0.31	0.96	0.00
% Perlidae	0.00	0.00	0.00	0.26	0.00	0.78	0.00	0.29	0.29	1.61	0.31	0.00	0.32	0.79
% Pteronarcyidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.64	0.26
% Simuliidae	4.10	10.71	4.49	4.66	2.47	7.77	2.53	1.47	4.71	6.45	4.31	11.38	0.64	0.00
Functional Group Composition														
% Filterers	15.14	65.18	36.23	67.62	15.43	57.77	16.77	48.68	45.29	70.65	28.00	46.77	25.32	19.11
% Gatherers	25.87	12.20	20.36	13.21	32.10	15.54	31.96	9.97	19.12	7.10	32.31	23.08	29.81	12.57
% Predators	35.33	14.29	14.67	9.84	26.85	12.18	23.42	14.08	12.06	9.68	23.08	9.54	12.82	22.51
% Scrapers	16.72	2.98	8.38	3.63	8.02	2.07	15.51	20.82	14.12	8.39	8.62	7.38	16.99	35.86
% Shredders	5.68	5.36	19.16	5.70	16.36	11.66	7.91	1.76	6.47	3.87	6.15	8.92	9.29	5.24
% Piercer-Herbivores	0.32	0.00	1.20	0.00	1.23	0.26	2.22	2.93	0.88	0.00	0.92	3.38	2.88	1.05
% Unclassified	0.95	0.00	0.00	0.00	0.00	0.52	0.95	1.76	0.59	0.32	0.92	0.92	2.88	3.66
Filterer Richness	6.00	5.00	5.00	5.00	9.00	7.00	10.00	8.00	11.00	11.00	14.00	12.00	13.00	13.00
Gatherer Richness	16.00	11.00	15.00	11.00	16.00	11.00	23.00	5.00	21.00	12.00	27.00	19.00	28.00	14.00

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Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
Predator Richness	15.00	10.00	12.00	7.00	12.00	8.00	15.00	11.00	16.00	12.00	20.00	11.00	11.00	14.00
Scraper Richness	5.00	4.00	5.00	4.00	6.00	3.00	10.00	6.00	9.00	8.00	10.00	6.00	10.00	10.00
Shredder Richness	4.00	5.00	7.00	4.00	7.00	3.00	5.00	2.00	7.00	7.00	8.00	6.00	8.00	5.00
Piercer-Herbivore Richness	1.00	0.00	1.00	0.00	1.00	1.00	2.00	2.00	2.00	0.00	3.00	1.00	2.00	2.00
Unclassified	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	3.00	1.00
Diversity/Evenness Measures														
Shannon-Weaver H' (log 10)	1.33	1.00	1.33	0.96	1.46	1.15	1.66	1.12	1.53	1.29	1.68	1.53	1.71	1.51
Shannon-Weaver H' (log 2)	4.43	3.31	4.43	3.20	4.86	3.81	5.53	3.71	5.07	4.29	5.57	5.07	5.67	5.01
Shannon-Weaver H' (log e)	3.07	2.30	3.07	2.22	3.37	2.64	3.83	2.57	3.51	2.97	3.86	3.51	3.93	3.47
Margalef's Richness	7.03	5.22	5.79	4.17	7.62	3.61	8.12	4.65	9.39	6.08	11.83	6.67	10.38	8.37
Pielou's J'	0.79	0.65	0.81	0.65	0.86	0.75	0.91	0.72	0.83	0.76	0.87	0.87	0.91	0.85
Simpson's Heterogeneity	0.93	0.80	0.93	0.80	0.95	0.89	0.97	0.88	0.95	0.91	0.97	0.96	0.97	0.95
Biotic Indices														
% Indiv. w/ HBI Value	96.21	98.81	96.71	96.89	92.90	94.56	81.96	90.62	90.59	97.42	90.46	88.92	83.97	78.53
Hilsenhoff Biotic Index	6.71	5.30	5.09	5.43	5.41	5.15	5.41	4.99	4.69	4.84	5.58	4.82	4.51	3.73
% Indiv. w/ MTI Value	31.23	85.12	63.17	88.34	49.38	72.54	43.67	61.58	54.12	46.77	48.62	42.15	26.92	23.56
Metals Tolerance Index	4.35	4.87	4.18	5.14	4.24	4.62	3.75	4.60	4.28	4.76	4.24	4.66	4.15	3.43
% Indiv. w/ FSBI Value	15.46	61.31	36.83	37.31	27.47	43.01	23.42	30.50	24.12	29.68	20.31	29.54	16.35	18.85
Fine Sediment Biotic Index	38.00	33.00	37.00	27.00	26.00	36.00	49.00	41.00	54.00	45.00	57.00	59.00	52.00	55.00
FSBI - average	0.79	0.94	0.82	0.87	0.51	1.06	0.73	1.17	0.79	0.88	0.68	1.04	0.69	0.93
FSBI - weighted average	4.10	2.72	3.96	2.62	4.47	3.02	4.46	3.66	4.13	2.89	3.83	3.72	4.16	5.17
% Indiv. w/ TPM Value	32.81	60.12	47.90	49.22	29.32	45.08	32.91	36.95	29.71	29.03	35.38	36.00	35.26	38.48
Temp. Pref. Metric - average	0.77	1.54	1.64	2.00	1.00	1.53	0.79	0.91	0.88	1.10	1.10	1.61	0.99	0.97
TPM - weighted average	2.77	2.11	3.44	2.79	3.66	3.13	3.04	2.64	3.44	2.58	2.79	4.26	2.67	3.71
Karr BIBI Metrics														
Long-Lived Taxa Richness	6.00	2.00	1.00	2.00	2.00	2.00	4.00	5.00	8.00	7.00	8.00	4.00	4.00	3.00
Clinger Richness	17.00	13.00	21.00	14.00	20.00	17.00	29.00	17.00	32.00	27.00	34.00	27.00	32.00	32.00

Palmerton Benthos 2006 Aquashicola Creek Metrics														
Data are adjusted for subsampling														
Site ID	**AC01**	**AC01**	**AC02/03**	**AC02/03**	**AC04**	**AC04**	**AC05**	**AC05**	**AC06**	**AC06**	**AC07**	**AC07**	**AC08**	**AC08**
Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-11-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-10-2006**	**10-09-2006**	**10-09-2006**
Percent Subsampled	**39.53**	**50.00**	**16.67**	**29.15**	**45.87**	**4.17**	**9.37**	**22.94**	**27.10**	**8.33**	**29.15**	**7.29**	**25.00**	**37.45**
EcoAnalysts Sample ID	**888-20**	**888-19**	**888-18**	**888-17**	**888-16**	**888-15**	**888-14**	**888-13**	**888-12**	**888-11**	**888-10**	**888-9**	**888-8**	**888-7**
% Clingers	49.53	73.51	67.96	79.02	36.73	71.76	42.09	52.49	60.00	75.16	53.85	59.08	48.08	44.50
Intolerant Taxa Richness	4.00	4.00	6.00	3.00	7.00	6.00	9.00	8.00	13.00	13.00	12.00	11.00	16.00	16.00
% Tolerant Individuals	9.85	1.36	0.41	0.23	2.59	0.00	1.30	0.15	1.23	0.11	2.58	0.05	2.00	1.00
% Tolerant Taxa	22.92	14.29	11.11	16.13	15.69	2.94	13.43	5.71	8.82	1.96	11.90	7.02	16.00	3.39
Coleoptera Richness	3.00	3.00	4.00	2.00	5.00	3.00	5.00	5.00	7.00	5.00	9.00	4.00	5.00	7.00

Palmerton Benthos 2007 Aquashicola Creek Taxa						
Data are NOT adjusted for subsampling						
	Site ID	**AC01**	**AC02/03**	**AC04**	**AC05**	**AC06**
	Sampling Method	**Kick**	**Kick**	**Kick**	**Kick**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Riffle**	**Riffle**	**Riffle**	**Riffle**	**Riffle**
	Collection Date	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-01-2007**
	Percent Subsampled	**10.42**	**23.42**	**31.25**	**25.00**	**31.25**
	EcoAnalysts Sample ID	**892.2-5**	**892.2-4**	**892.2-3**	**892.2-2**	**892.2-1**
Ephemeroptera	*Acentrella turbida*	0	0	0	8	4
	Baetis flavistriga	0	0	0	18	23
	Baetis intercalaris	0	0	0	16	4
	Baetis pluto	0	0	0	0	1
	Baetis sp.	0	0	0	0	1
	Baetis tricaudatus	*0*	*0*	*0*	*0*	*0*
	Caenis sp.	*0*	*0*	*0*	*0*	*0*
	Centroptilum sp.	*0*	*0*	*0*	*0*	*0*
	Epeorus sp.	0	0	0	2	0
	Ephemerella invaria	*0*	*0*	*0*	*0*	*0*
	Ephemerella sp.	*0*	*0*	*0*	*0*	*0*
	Ephemerellidae	*0*	*0*	*0*	*0*	*0*
	Eurylophella sp.	*0*	*0*	*0*	*0*	*0*
	Heptageniidae	*0*	*0*	*0*	*0*	*0*
	Heterocloeon sp.	0	0	0	0	5
	Isonychia sp.	0	0	0	2	8
	Leptophlebiidae	*0*	*0*	*0*	*0*	*0*
	Leucrocuta sp.	*0*	*0*	*0*	*0*	*0*
	Maccaffertium ithaca	*0*	*0*	*0*	*0*	*0*
	Maccaffertium mediopunctatum	*0*	*0*	*0*	*0*	*0*
	Maccaffertium modestum	*0*	*0*	*0*	*0*	*0*
	Maccaffertium pulchellum	*0*	*0*	*0*	*0*	*0*
	Maccaffertium sp.	0	0	0	20	25
	Plauditus sp.	0	0	0	13	27
	Procloeon sp.	*0*	*0*	*0*	*0*	*0*
	Pseudocloeon propinquum	*0*	*0*	*0*	*0*	*0*
	Serratella deficiens	*0*	*0*	*0*	*0*	*0*
	Serratella serrata	0	0	0	0	1
	Serratella serratoides	0	0	0	0	5
	Stenacron interpunctatum	*0*	*0*	*0*	*0*	*0*
	Stenonema modestum	*0*	*0*	*0*	*0*	*0*
	Stenonema sp.	*0*	*0*	*0*	*0*	*0*
	Tricorythodes sp.	*0*	*0*	*0*	*0*	*0*
Odonata	*Argia* sp.	*0*	*0*	*0*	*0*	*0*
	Boyeria sp.	*0*	*0*	*0*	*0*	*0*
	Boyeria vinosa	*0*	*0*	*0*	*0*	*0*
	Calopterygidae	*0*	*0*	*0*	*0*	*0*
	Calopteryx sp.	0	0	0	0	1
	Coenagrion/Enallagma sp.	*0*	*0*	*0*	*0*	*0*
	Coenagrionidae	*0*	*0*	*0*	*0*	*0*
	Gomphidae	0	0	0	0	1
	Gomphus sp.	*0*	*0*	*0*	*0*	*0*
	Hagenius brevistylus	*0*	*0*	*0*	*0*	*0*
	Libellulidae	*0*	*0*	*0*	*0*	*0*
	Macromia illinoiensis	*0*	*0*	*0*	*0*	*0*
	Macromia sp.	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2007 Aquashicola Creek Taxa						
Data are NOT adjusted for subsampling						
	Site ID	**AC01**	**AC02/03**	**AC04**	**AC05**	**AC06**
	Sampling Method	**Kick**	**Kick**	**Kick**	**Kick**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Riffle**	**Riffle**	**Riffle**	**Riffle**	**Riffle**
	Collection Date	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-01-2007**
	Percent Subsampled	**10.42**	**23.42**	**31.25**	**25.00**	**31.25**
	EcoAnalysts Sample ID	**892.2-5**	**892.2-4**	**892.2-3**	**892.2-2**	**892.2-1**
	Macromiinae	0	0	0	0	0
	Ophiogomphus sp.	0	0	0	0	0
	Stylogomphus albistylus	0	0	0	0	0
Plecoptera	*Acroneuria abnormis*	0	0	0	0	0
	Acroneuria sp.	0	0	0	0	0
	Capniidae	0	0	0	0	0
	Leuctra sp.	0	0	0	0	0
	Paragnetina immarginata	0	0	0	0	0
	Paragnetina media	0	0	0	0	1
	Paragnetina sp.	0	0	0	0	0
	Perlidae	0	0	0	0	0
	Perlodidae	0	0	0	0	0
	Plecoptera	0	0	0	0	0
	Pteronarcys sp.	0	0	0	0	0
	Sweltsa sp.	0	0	0	0	0
	Taeniopteryx sp.	0	0	0	0	0
	Tallaperla sp.	0	0	0	0	0
Hemiptera	Corixidae	0	0	0	0	0
	Neoplea sp.	0	0	0	0	0
Coleoptera	*Berosus* sp.	0	0	0	0	0
	Dubiraphia sp.	0	0	0	0	0
	Ectopria sp.	0	0	0	0	0
	Helichus sp.	0	0	0	0	0
	Hydrophilidae	0	0	0	0	0
	Laccobius sp.	0	0	0	0	0
	Macronychus glabratus	0	0	1	0	0
	Microcylloepus sp.	0	0	0	0	0
	Optioservus ovalis	0	0	0	0	0
	Optioservus sp.	0	0	0	0	1
	Optioservus trivittatus	1	8	14	19	14
	Oulimnius latiusculus	1	2	1	6	0
	Oulimnius nitidulus	0	0	0	0	0
	Oulimnius sp.	0	0	0	0	1
	Peltodytes sp.	0	0	0	0	0
	Promoresia tardella	1	0	20	1	26
	Psephenus herricki	1	2	0	17	0
	Stenelmis sp.	0	0	2	1	3
Megaloptera	Corydalidae	1	0	0	0	0
	Corydalus cornutus	0	0	0	0	0
	Nigronia serricornis	0	0	0	0	3
	Sialis sp.	0	0	0	0	0
Diptera-Chironomidae	*Ablabesmyia mallochi*	0	0	0	0	0
	Brillia sp.	0	0	0	0	0
	Cardiocladius sp.	5	11	3	0	1
	Chironomini	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0

Palmerton Benthos 2007 Aquashicola Creek Taxa						
Data are NOT adjusted for subsampling						
	Site ID	**AC01**	**AC02/03**	**AC04**	**AC05**	**AC06**
	Sampling Method	**Kick**	**Kick**	**Kick**	**Kick**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Riffle**	**Riffle**	**Riffle**	**Riffle**	**Riffle**
	Collection Date	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-01-2007**
	Percent Subsampled	**10.42**	**23.42**	**31.25**	**25.00**	**31.25**
	EcoAnalysts Sample ID	**892.2-5**	**892.2-4**	**892.2-3**	**892.2-2**	**892.2-1**
	Cladotanytarsus sp.	*0*	*0*	*0*	*0*	*0*
	Corynoneura sp.	*0*	*0*	*0*	*0*	*0*
	Cricotopus bicinctus gr.	3	6	0	1	0
	Cricotopus sp.	2	6	5	11	4
	Cricotopus trifascia gr.	0	0	0	6	0
	Cryptochironomus sp.	*0*	*0*	*0*	*0*	*0*
	Diamesa sp.	*0*	*0*	*0*	*0*	*0*
	Dicrotendipes modestus	*0*	*0*	*0*	*0*	*0*
	Dicrotendipes sp.	0	2	0	1	0
	Diplocladius sp.	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella claripennis gr.	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella devonica gr.	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella pseudomontana gr.	0	0	0	0	1
	Eukiefferiella sp.	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella tirolensis	*0*	*0*	*0*	*0*	*0*
	Gymnometriocnemus sp.	*0*	*0*	*0*	*0*	*0*
	Limnophyes sp.	*0*	*0*	*0*	*0*	*0*
	Micropsectra sp.	*0*	*0*	*0*	*0*	*0*
	Micropsectra/Tanytarsus sp.	*0*	*0*	*0*	*0*	*0*
	Microtendipes pedellus gr.	*0*	*0*	*0*	*0*	*0*
	Microtendipes rydalensis gr.	*0*	*0*	*0*	*0*	*0*
	Nanocladius sp.	1	0	0	0	0
	Neozavrelia sp.	*0*	*0*	*0*	*0*	*0*
	Nilotanypus fimbriatus	*0*	*0*	*0*	*0*	*0*
	Nilotanypus sp.	*0*	*0*	*0*	*0*	*0*
	Orthocladiinae	*0*	*0*	*0*	*0*	*0*
	Orthocladius (Euortho.) rivicola gr.	*0*	*0*	*0*	*0*	*0*
	Orthocladius (Euorthocladius) sp.	*0*	*0*	*0*	*0*	*0*
	Orthocladius Complex	10	35	56	24	3
	Orthocladius annectens	2	11	0	10	2
	Orthocladius sp.	0	2	0	1	1
	Parakiefferiella sp.	*0*	*0*	*0*	*0*	*0*
	Parametriocnemus sp.	1	0	1	0	0
	Paratanytarsus sp.	*0*	*0*	*0*	*0*	*0*
	Paratendipes sp.	*0*	*0*	*0*	*0*	*0*
	Phaenopsectra sp.	*0*	*0*	*0*	*0*	*0*
	Polypedilum aviceps	*0*	*0*	*0*	*0*	*0*
	Polypedilum flavum	*0*	*0*	*0*	*0*	*0*
	Polypedilum illinoense gr.	*0*	*0*	*0*	*0*	*0*
	Polypedilum ontario	*0*	*0*	*0*	*0*	*0*
	Polypedilum sp.	*0*	*0*	*0*	*0*	*0*
	Polypedilum tritum	*0*	*0*	*0*	*0*	*0*
	Potthastia gaedii gr.	3	2	2	0	5
	Potthastia longimana gr.	*0*	*0*	*0*	*0*	*0*
	Procladius sp.	*0*	*0*	*0*	*0*	*0*
	Psectrocladius sp.	0	1	0	0	0

Palmerton Benthos 2007 Aquashicola Creek Taxa						
Data are NOT adjusted for subsampling						
	Site ID	**AC01**	**AC02/03**	**AC04**	**AC05**	**AC06**
	Sampling Method	**Kick**	**Kick**	**Kick**	**Kick**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Riffle**	**Riffle**	**Riffle**	**Riffle**	**Riffle**
	Collection Date	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-01-2007**
	Percent Subsampled	**10.42**	**23.42**	**31.25**	**25.00**	**31.25**
	EcoAnalysts Sample ID	**892.2-5**	**892.2-4**	**892.2-3**	**892.2-2**	**892.2-1**
	Rheocricotopus sp.	*0*	*0*	*0*	*0*	*0*
	Rheotanytarsus exiguus gr.	0	0	0	2	5
	Rheotanytarsus pellucidus gr.	0	0	0	0	3
	Stempellina sp.	*0*	*0*	*0*	*0*	*0*
	Stenochironomus sp.	*0*	*0*	*0*	*0*	*0*
	Stilocladius sp.	*0*	*0*	*0*	*0*	*0*
	Sublettea sp.	0	0	0	1	4
	Synorthocladius sp.	0	0	0	0	1
	Tanytarsini	*0*	*0*	*0*	*0*	*0*
	Tanytarsus sp.	0	0	0	4	0
	Thienemanniella sp.	*0*	*0*	*0*	*0*	*0*
	Thienemannimyia gr. sp.	0	1	5	0	0
	Tvetenia bavarica gr.	*0*	*0*	*0*	*0*	*0*
	Tvetenia discoloripes gr.	0	0	1	0	4
	Xenochironomus xenolabis	*0*	*0*	*0*	*0*	*0*
Diptera	*Antocha* sp.	0	0	0	1	8
	Atherix sp.	0	0	0	0	3
	Atrichopogon sp.	*0*	*0*	*0*	*0*	*0*
	Ceratopogoninae	0	0	0	0	0
	Empididae	*0*	*0*	*0*	*0*	*0*
	Ephydridae	*0*	*0*	*0*	*0*	*0*
	Forcipomyia sp.	*0*	*0*	*0*	*0*	*0*
	Hemerodromia sp.	3	12	37	2	0
	Limonia sp.	*0*	*0*	*0*	*0*	*0*
	Muscidae	0	0	0	1	0
	Pericoma/Telmatoscopus sp.	*0*	*0*	*0*	*0*	*0*
	Psychodidae	*0*	*0*	*0*	*0*	*0*
	Sciomyzidae	*0*	*0*	*0*	*0*	*0*
	Simulium sp.	0	0	0	0	5
	Stilobezzia sp.	*0*	*0*	*0*	*0*	*0*
	Tipula sp.	0	0	1	0	0
	Tipulidae	*0*	*0*	*0*	*0*	*0*
Trichoptera	*Apatania* sp.	4	1	2	3	0
	Brachycentrus appalachia	0	1	0	0	0
	Brachycentrus numerosus	0	0	0	0	1
	Ceraclea sp.	*0*	*0*	*0*	*0*	*0*
	Cheumatopsyche sp.	73	54	23	35	35
	Chimarra aterrima	0	0	0	0	1
	Chimarra obscura	*0*	*0*	*0*	*0*	*0*
	Chimarra socia	*0*	*0*	*0*	*0*	*0*
	Chimarra sp.	0	0	0	2	0
	Culoptila sp.	*0*	*0*	*0*	*0*	*0*
	Diplectrona sp.	*0*	*0*	*0*	*0*	*0*
	Dolophilodes sp.	*0*	*0*	*0*	*0*	*0*
	Glossosoma sp.	0	0	0	0	1
	Goera sp.	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2007 Aquashicola Creek Taxa						
Data are NOT adjusted for subsampling						
	Site ID	**AC01**	**AC02/03**	**AC04**	**AC05**	**AC06**
	Sampling Method	**Kick**	**Kick**	**Kick**	**Kick**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Riffle**	**Riffle**	**Riffle**	**Riffle**	**Riffle**
	Collection Date	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-01-2007**
	Percent Subsampled	**10.42**	**23.42**	**31.25**	**25.00**	**31.25**
	EcoAnalysts Sample ID	**892.2-5**	**892.2-4**	**892.2-3**	**892.2-2**	**892.2-1**
	Hydropsyche betteni	*0*	*0*	*0*	*0*	*0*
	Helicopsyche borealis	2	0	0	0	0
	Hydropsyche bronta	0	0	0	6	0
	Hydropsyche leonardi	*0*	*0*	*0*	*0*	*0*
	Hydropsyche morosa	213	97	29	75	39
	Hydropsyche scalaris	*0*	*0*	*0*	*0*	*0*
	Hydropsyche slossonae	5	0	0	0	0
	Hydropsyche sp.	3	0	0	0	0
	Hydropsyche sparna	0	0	6	0	8
	Hydroptila sp.	2	0	5	2	0
	Leptoceridae	1	0	0	0	0
	Lepidostoma sp.	*0*	*0*	*0*	*0*	*0*
	Leucotrichia pictipes	0	0	0	10	3
	Limnephilidae	*0*	*0*	*0*	*0*	*0*
	Lype diversa	*0*	*0*	*0*	*0*	*0*
	Macrostemum sp.	*0*	*0*	*0*	*0*	*0*
	Micrasema sp.	2	20	57	2	4
	Mystacides sepulchralis	0	0	0	0	1
	Neophylax fuscus	0	0	0	0	0
	Neureclipsis sp.	7	11	6	0	0
	Nyctiophylax sp.	*0*	*0*	*0*	*0*	*0*
	Oecetis furva gr.	*0*	*0*	*0*	*0*	*0*
	Oecetis persimilis	*0*	*0*	*0*	*0*	*0*
	Oecetis sp.	2	2	4	0	0
	Phylocentropus sp.	*0*	*0*	*0*	*0*	*0*
	Polycentropodidae	*0*	*0*	*0*	*0*	*0*
	Polycentropus sp.	*0*	*0*	*0*	*0*	*0*
	Protoptila sp.	*0*	*0*	*0*	*0*	*0*
	Psychomyia flavida	5	0	0	1	2
	Psychomyia nomada	*0*	*0*	*0*	*0*	*0*
	Pycnopsyche sp.	*0*	*0*	*0*	*0*	*0*
	Rhyacophila formosa	0	0	3	0	1
	Rhyacophila fuscula	*0*	*0*	*0*	*0*	*0*
	Rhyacophila mainensis	0	0	0	1	0
	Rhyacophila minora	*0*	*0*	*0*	*0*	*0*
	Rhyacophila sp.	0	0	0	0	0
	Petrophila sp.	*0*	*0*	*0*	*0*	*0*
Gastropoda	*Amnicola* sp.	*0*	*0*	*0*	*0*	*0*
	Ancylidae	*0*	*0*	*0*	*0*	*0*
	Ferrissia sp.	0	0	0	14	7
	Fossaria sp.	*0*	*0*	*0*	*0*	*0*
	Gyraulus sp.	0	0	0	1	0
	Helisoma anceps	0	0	0	0	1
	Hydrobiidae	*0*	*0*	*0*	*0*	*0*
	Lymnaeidae	*0*	*0*	*0*	*0*	*0*
	Micromenetus sp.	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2007 Aquashicola Creek Taxa						
Data are NOT adjusted for subsampling						
	Site ID	**AC01**	**AC02/03**	**AC04**	**AC05**	**AC06**
	Sampling Method	**Kick**	**Kick**	**Kick**	**Kick**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Riffle**	**Riffle**	**Riffle**	**Riffle**	**Riffle**
	Collection Date	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-01-2007**
	Percent Subsampled	**10.42**	**23.42**	**31.25**	**25.00**	**31.25**
	EcoAnalysts Sample ID	**892.2-5**	**892.2-4**	**892.2-3**	**892.2-2**	**892.2-1**
	Physa sp.	*0*	*0*	*0*	*0*	*0*
	Planorbidae	0	0	0	3	0
Bivalvia	*Pisidium* sp.	*0*	*0*	*0*	*0*	*0*
	Sphaeriidae	1	0	0	0	2
	Sphaerium sp.	0	0	0	4	0
Annelida	*Aulodrilus limnobius*	*0*	*0*	*0*	*0*	*0*
	Dero furcata	*0*	*0*	*0*	*0*	*0*
	Enchytraeidae	*0*	*0*	*0*	*0*	*0*
	Erpobdellidae	*0*	*0*	*0*	*0*	*0*
	Glossiphoniidae	*0*	*0*	*0*	*0*	*0*
	Helobdella elongata	*0*	*0*	*0*	*0*	*0*
	Lumbricina	*0*	*0*	*0*	*0*	*0*
	Lumbriculidae	0	0	0	2	2
	Manayunkia speciosa	*0*	*0*	*0*	*0*	*0*
	Nais behningi	0	0	0	0	1
	Nais bretscheri	*0*	*0*	*0*	*0*	*0*
	Nais communis	*0*	*0*	*0*	*0*	*0*
	Nais simplex	*0*	*0*	*0*	*0*	*0*
	Nais sp.	0	0	0	1	0
	Nais variabilis	*0*	*0*	*0*	*0*	*0*
	Pristina jenkinae	*0*	*0*	*0*	*0*	*0*
	Pristina osborni	*0*	*0*	*0*	*0*	*0*
	Tubificidae w/ cap setae	0	0	0	1	0
	Tubificidae w/o cap setae	*0*	*0*	*0*	*0*	*0*
Acari	Acari	*0*	*0*	*0*	*0*	*0*
	Arrenurus sp.	*0*	*0*	*0*	*0*	*0*
	Atractides sp.	0	0	0	1	1
	Aturus sp.	0	0	0	1	0
	Clathrosperchon sp.	*0*	*0*	*0*	*0*	*0*
	Hygrobates sp.	0	0	2	1	3
	Lebertia sp.	2	10	18	8	6
	Limnesia sp.	*0*	*0*	*0*	*0*	*0*
	Mideopsis sp.	0	0	0	0	2
	Neumania sp.	*0*	*0*	*0*	*0*	*0*
	Oribatei	0	0	0	1	0
	Protzia sp.	*0*	*0*	*0*	*0*	*0*
	Sperchon sp.	0	7	8	5	5
	Sperchonopsis sp.	*0*	*0*	*0*	*0*	*0*
	Torrenticola sp.	*0*	*0*	*0*	*0*	*0*
Crustacea	*Caecidotea* sp.	*0*	*0*	*0*	*0*	*0*
	Cambarus bartonii	*0*	*0*	*0*	*0*	*0*
	Cambarus sp.	*0*	*0*	*0*	*0*	*0*
	Crangonyx sp.	*0*	*0*	*0*	*0*	*0*
	Gammarus sp.	0	0	0	0	1
	Hyalella sp.	*0*	*0*	*0*	*0*	*0*
	Orconectes sp.	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2007 Aquashicola Creek Taxa						
Data are NOT adjusted for subsampling						
	Site ID	**AC01**	**AC02/03**	**AC04**	**AC05**	**AC06**
	Sampling Method	**Kick**	**Kick**	**Kick**	**Kick**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Riffle**	**Riffle**	**Riffle**	**Riffle**	**Riffle**
	Collection Date	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-02-2007**	**08-01-2007**
	Percent Subsampled	**10.42**	**23.42**	**31.25**	**25.00**	**31.25**
	EcoAnalysts Sample ID	**892.2-5**	**892.2-4**	**892.2-3**	**892.2-2**	**892.2-1**
	Ostracoda	*0*	*0*	*0*	*0*	*0*
	Stygobromus sp.	*0*	*0*	*0*	*0*	*0*
Other Organisms	Nematoda	1	1	3	2	2
	Prostoma sp.	1	0	1	5	2
	Turbellaria	9	4	19	20	1
	TOTAL	**368**	**309**	**335**	**395**	**337**

Palmerton Benthos 2006-Aquashicola Creek Metrics
Data are adjusted for subsampling

Site ID	AC01	AC02/03	AC04	AC05	AC06
Sampling Method	Kick	Kick	Kick	Kick	Kick
Device	D-frame	D-frame	D-frame	D-frame	D-frame
Habitat	Riffle	Riffle	Riffle	Riffle	Riffle
Collection Date	08-02-2007	08-02-2007	08-02-2007	08-02-2007	08-01-2007
Percent Subsampled	10.42	23.42	31.25	25.00	31.25
EcoAnalysts Sample ID	892.2-5	892.2-4	892.2-3	892.2-2	892.2-1
Abundance Measures					
Corrected Abundance	3532.80	1319.43	1072.00	1580.00	1078.40
EPT Abundance	3062.40	794.22	432.00	864.00	643.20
Dominance Measures					
Dominant Taxon	*Hydropsyche morosa*	*Hydropsyche morosa*	*Micrasema* sp.	*Hydropsyche morosa*	*Hydropsyche morosa*
Dominant Abundance	2044.80	414.19	182.40	300.00	124.80
2nd Dominant Taxon	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.	*Orthocladius* Complex	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.
2nd Dominant Abundance	700.80	230.58	179.20	140.00	112.00
3rd Dominant Taxon	*Orthocladius* Complex	*Orthocladius* Complex	*Hemerodromia* sp.	*Orthocladius* Complex	*Plauditus* sp.
3rd Dominant Abundance	96.00	149.45	118.40	96.00	86.40
% Dominant Taxon	57.88	31.39	17.01	18.99	11.57
% 2 Dominant Taxa	77.72	48.87	33.73	27.85	21.96
% 3 Dominant Taxa	80.43	60.19	44.78	33.92	29.97
Richness Measures					
Species Richness	31.00	25.00	29.00	51.00	60.00
EPT Richness	12.00	7.00	9.00	17.00	23.00
Ephemeroptera Richness	0.00	0.00	0.00	7.00	11.00
Plecoptera Richness	0.00	0.00	0.00	0.00	1.00
Trichoptera Richness	12.00	7.00	9.00	10.00	11.00
Chironomidae Richness	8.00	10.00	7.00	10.00	12.00
Oligochaeta Richness	0.00	0.00	0.00	3.00	2.00
Non-Chiro. Non-Olig. Richness	23.00	15.00	22.00	38.00	46.00
Rhyacophila Richness	0.00	0.00	1.00	1.00	1.00
Community Composition					
% Ephemeroptera	0.00	0.00	0.00	20.00	30.86
% Plecoptera	0.00	0.00	0.00	0.00	0.30
% Trichoptera	86.68	60.19	40.30	34.68	28.49
% EPT	86.68	60.19	40.30	54.68	59.64
% Coleoptera	1.09	3.88	11.34	11.14	13.35
% Diptera	8.15	28.80	33.13	16.46	14.84
% Oligochaeta	0.00	0.00	0.00	1.01	0.89
% Baetidae	0.00	0.00	0.00	13.92	19.29
% Brachycentridae	0.54	6.80	17.01	0.51	1.48
% Chironomidae	7.34	24.92	21.79	15.44	10.09
% Ephemerellidae	0.00	0.00	0.00	0.00	1.78
% Hydropsychidae	79.89	48.87	17.31	29.37	24.33
% Odonata	0.00	0.00	0.00	0.00	0.59
% Perlidae	0.00	0.00	0.00	0.00	0.30
% Pteronarcyidae	0.00	0.00	0.00	0.00	0.00

Palmerton Benthos 2006-Aquashicola Creek Metrics
Data are adjusted for subsampling

Site ID	AC01	AC02/03	AC04	AC05	AC06
Sampling Method	Kick	Kick	Kick	Kick	Kick
Device	D-frame	D-frame	D-frame	D-frame	D-frame
Habitat	Riffle	Riffle	Riffle	Riffle	Riffle
Collection Date	08-02-2007	08-02-2007	08-02-2007	08-02-2007	08-01-2007
Percent Subsampled	10.42	23.42	31.25	25.00	31.25
EcoAnalysts Sample ID	892.2-5	892.2-4	892.2-3	892.2-2	892.2-1
% Simuliidae	0.00	0.00	0.00	0.00	1.48
Functional Group Composition					
% Filterers	82.07	52.75	19.10	33.16	32.94
% Gatherers	6.52	17.80	18.21	26.08	29.38
% Predators	6.52	15.53	29.85	12.15	9.50
% Scrapers	2.45	3.56	11.34	20.51	23.15
% Shredders	1.90	10.36	19.10	5.06	2.37
% Piercer-Herbivores	0.54	0.00	1.49	3.04	0.89
% Unclassified	0.00	0.00	0.90	0.00	1.78
Filterer Richness	6.00	4.00	4.00	9.00	11.00
Gatherer Richness	8.00	7.00	5.00	14.00	22.00
Predator Richness	8.00	8.00	10.00	12.00	14.00
Scraper Richness	5.00	3.00	4.00	10.00	8.00
Shredder Richness	3.00	3.00	4.00	4.00	2.00
Piercer-Herbivore Richness	1.00	0.00	1.00	2.00	1.00
Unclassified	0.00	0.00	1.00	0.00	2.00
Diversity/Evenness Measures					
Shannon-Weaver H' (log 10)	0.72	1.03	1.17	1.39	1.47
Shannon-Weaver H' (log 2)	2.39	3.41	3.88	4.61	4.89
Shannon-Weaver H' (log e)	1.66	2.36	2.69	3.20	3.39
Margalef's Richness	3.67	3.34	4.01	6.79	8.45
Pielou's J'	0.48	0.73	0.80	0.81	0.83
Simpson's Heterogeneity	0.62	0.85	0.91	0.93	0.95
Biotic Indices					
% Indiv. w/ HBI Value	99.46	94.50	90.75	89.87	83.98
Hilsenhoff Biotic Index	5.52	5.40	4.50	5.23	4.35
% Indiv. w/ MTI Value	90.49	70.23	59.70	49.62	40.06
Metals Tolerance Index	4.96	4.90	3.84	4.41	4.47
% Indiv. w/ FSBI Value	25.00	28.16	37.31	20.00	24.93
Fine Sediment Biotic Index	33.00	18.00	26.00	50.00	42.00
FSBI - average	1.06	0.72	0.90	0.98	0.70
FSBI - weighted average	2.68	2.93	4.01	3.63	3.50
% Indiv. w/ TPM Value	29.08	46.60	51.04	32.15	26.41
Temp. Pref. Metric - average	1.39	1.36	1.41	0.84	1.00
TPM - weighted average	2.03	3.31	4.77	2.96	2.79
Karr BIBI Metrics					
Long-Lived Taxa Richness	2.00	1.00	3.00	3.00	7.00
Clinger Richness	15.00	11.00	11.00	26.00	26.00
% Clingers	88.32	68.28	42.39	67.09	64.69
Intolerant Taxa Richness	5.00	3.00	3.00	7.00	11.00
% Tolerant Individuals	0.09	0.16	0.51	0.70	0.44
% Tolerant Taxa	6.45	12.00	6.90	11.76	5.00

Palmerton Benthos 2006-Aquashicola Creek Metrics
Data are adjusted for subsampling

Site ID	AC01	AC02/03	AC04	AC05	AC06
Sampling Method	Kick	Kick	Kick	Kick	Kick
Device	D-frame	D-frame	D-frame	D-frame	D-frame
Habitat	Riffle	Riffle	Riffle	Riffle	Riffle
Collection Date	08-02-2007	08-02-2007	08-02-2007	08-02-2007	08-01-2007
Percent Subsampled	10.42	23.42	31.25	25.00	31.25
EcoAnalysts Sample ID	892.2-5	892.2-4	892.2-3	892.2-2	892.2-1
Coleoptera Richness	4.00	3.00	5.00	5.00	5.00

Palmerton Benthos 2007 Lehigh Creek Taxa

Data are NOT adjusted for subsampling

	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
Ephemeroptera	*Acentrella turbida*	7	8	1	2	3	6	4	8	8	10	19	20	7	24
	Baetis flavistriga	2	3	7	0	2	3	3	3	7	4	25	32	11	12
	Baetis intercalaris	25	32	39	43	22	14	65	32	30	33	79	80	60	94
	Baetis pluto	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Baetis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Baetis tricaudatus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Caenis sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Centroptilum sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Epeorus sp.	0	0	0	0	0	0	4	4	5	4	8	5	2	4
	Ephemerella invaria	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ephemerella sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ephemerellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Eurylophella sp.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Heptageniidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Heterocloeon sp.	24	30	13	11	36	50	15	19	18	29	13	3	7	4
	Isonychia sp.	0	0	0	0	1	1	14	16	11	9	4	7	4	5
	Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	4	0	1
	Leucrocuta sp.	0	0	0	0	0	0	1	0	0	0	1	0	0	1
	Maccaffertium ithaca	0	0	0	0	0	0	1	0	0	0	2	0	0	0
	Maccaffertium mediopunctatum	0	0	0	0	0	0	1	0	1	0	0	0	0	0
	Maccaffertium modestum	0	0	0	0	0	0	23	0	0	0	0	0	0	0
	Maccaffertium pulchellum	0	0	0	0	0	0	2	0	0	0	0	0	0	0
	Maccaffertium sp.	0	0	2	1	2	1	0	4	10	5	21	23	14	24
	Plauditus sp.	20	15	12	13	11	10	21	7	19	4	13	17	11	30
	Procloeon sp.	0	0	0	0	0	0	0	0	0	0	1	0	2	0
	Pseudocloeon propinquum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Serratella deficiens	0	0	0	0	0	0	1	1	1	1	0	0	0	0
	Serratella serrata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Serratella serratoides	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stenacron interpunctatum	0	1	0	0	1	0	0	0	0	0	0	0	0	0

Palmerton Benthos 2007 Lehigh Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Stenonema modestum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stenonema sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Tricorythodes sp.	0	0	1	0	0	0	5	0	0	0	1	3	1	6
Odonata	*Argia* sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Boyeria sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Boyeria vinosa	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Calopterygidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Calopteryx sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Coenagrion/Enallagma sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Coenagrionidae	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Gomphidae	0	0	0	0	0	0	0	0	0	0	0	1	1	0
	Gomphus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Hagenius brevistylus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Libellulidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Macromia illinoiensis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Macromia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Macromiinae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ophiogomphus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stylogomphus albistylus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Plecoptera	*Acroneuria abnormis*	1	1	1	1	0	0	0	0	1	1	2	6	0	0
	Acroneuria sp.	0	0	0	0	2	1	2	0	0	0	0	0	3	0
	Capniidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Leuctra sp.	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	Paragnetina immarginata	0	3	0	0	1	0	0	0	7	5	0	6	3	7
	Paragnetina media	0	0	0	0	0	0	0	7	1	0	5	0	3	4
	Paragnetina sp.	1	0	0	0	1	0	3	0	0	0	3	0	0	0
	Perlidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Perlodidae	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Plecoptera	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pteronarcys sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2007 Lehigh Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Sweltsa sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Taeniopteryx sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Tallaperla sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Hemiptera	Corixidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Neoplea sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Coleoptera	*Berosus* sp.	0	0	0	0	0	0	4	0	0	0	0	0	0	0
	Dubiraphia sp.	0	0	1	0	2	0	1	0	0	0	3	0	1	0
	Ectopria sp.	0	0	0	0	0	0	0	0	0	0	3	0	0	0
	Helichus sp.	0	0	0	0	0	0	0	0	0	0	2	0	0	0
	Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Laccobius sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Macronychus glabratus	0	0	0	1	0	0	0	0	0	0	9	0	3	0
	Microcylloepus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Optioservus ovalis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Optioservus sp.	8	1	1	0	8	0	0	0	0	0	0	4	0	0
	Optioservus trivittatus	0	0	0	2	0	3	6	6	11	6	1	0	0	2
	Oulimnius latiusculus	5	4	0	4	8	14	12	16	12	9	20	45	23	22
	Oulimnius nitidulus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Oulimnius sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Peltodytes sp.	0	0	0	0	0	0	0	0	0	0	2	0	1	0
	Promoresia tardella	0	0	0	0	0	0	0	1	0	0	14	15	1	2
	Psephenus herricki	1	1	3	2	0	0	10	0	4	5	1	3	11	1
	Stenelmis sp.	146	92	75	89	78	95	26	59	64	42	77	95	43	92
Megaloptera	Corydalidae	0	0	0	1	0	0	0	0	0	0	2	0	2	0
	Corydalus cornutus	0	2	0	0	0	0	1	0	0	0	0	0	1	1
	Nigronia serricornis	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	Sialis sp.	0	0	0	0	0	0	0	0	0	0	0	2	1	0
Diptera-Chironomidae	*Ablabesmyia mallochi*	0	0	1	0	0	0	0	0	1	0	1	0	0	0
	Brillia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Cardiocladius sp.	2	3	0	0	0	1	0	4	3	2	9	3	0	10

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Data are NOT adjusted for subsampling

	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Chironomini	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Chironomus sp.	0	0	6	0	0	0	0	0	0	0	0	0	0	0
	Cladotanytarsus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Corynoneura sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Cricotopus bicinctus gr.	0	1	3	4	0	2	0	2	0	0	1	1	0	6
	Cricotopus sp.	0	0	0	0	0	0	0	0	1	0	0	4	1	0
	Cricotopus trifascia gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Cryptochironomus sp.	0	0	0	0	0	0	0	0	0	0	1	0	1	0
	Diamesa sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Dicrotendipes modestus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Dicrotendipes sp.	0	0	1	0	0	0	6	0	0	0	0	0	0	0
	Diplocladius sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella claripennis gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella devonica gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella pseudomontana gr.	0	0	0	0	0	0	0	0	0	0	0	2	0	0
	Eukiefferiella sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Eukiefferiella tirolensis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Gymnometriocnemus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Limnophyes sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Micropsectra sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Micropsectra/Tanytarsus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Microtendipes pedellus gr.	0	0	0	0	0	0	0	0	0	0	3	0	1	2
	Microtendipes rydalensis gr.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Nanocladius sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Neozavrelia sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Nilotanypus fimbriatus	0	0	0	0	1	0	0	0	0	0	0	0	1	0
	Nilotanypus sp.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Orthocladiinae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Orthocladius (Euortho.) rivicola gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2007 Lehigh Creek Taxa

Data are NOT adjusted for subsampling

	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Orthocladius (Euorthocladius) sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Orthocladius Complex	1	0	0	1	0	0	7	12	0	0	1	1	0	6
	Orthocladius annectens	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Orthocladius sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Parakiefferiella sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Parametriocnemus sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Paratanytarsus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Paratendipes sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Phaenopsectra sp.	0	0	0	0	0	0	0	0	0	0	1	0	3	0
	Polypedilum aviceps	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Polypedilum flavum	0	0	2	1	0	0	4	0	1	0	3	4	6	21
	Polypedilum illinoense gr.	0	0	0	0	0	0	2	0	0	0	2	2	2	2
	Polypedilum ontario	1	0	0	0	1	0	0	0	0	0	0	0	0	0
	Polypedilum sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Polypedilum tritum	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Potthastia gaedii gr.	0	0	0	0	0	0	0	1	0	0	1	0	0	4
	Potthastia longimana gr.	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Procladius sp.	0	0	4	0	1	0	0	0	0	0	1	0	8	0
	Psectrocladius sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Rheocricotopus sp.	0	0	2	0	0	1	2	1	1	1	0	1	6	1
	Rheotanytarsus exiguus gr.	4	0	0	0	0	0	1	0	1	0	0	4	3	4
	Rheotanytarsus pellucidus gr.	0	0	0	0	0	0	0	0	0	0	0	0	0	6
	Stempellina sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Stenochironomus sp.	0	0	0	0	0	1	3	0	0	0	0	0	0	0
	Stilocladius sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Sublettea sp.	0	0	0	0	0	0	0	0	1	0	0	3	0	2
	Synorthocladius sp.	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Tanytarsini	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Tanytarsus sp.	0	1	29	2	0	0	2	0	0	0	8	4	7	7

Palmerton Benthos 2007 Lehigh Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Thienemanniella sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0	0	0	0	4	0	5	2
	Tvetenia bavarica gr.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Tvetenia discoloripes gr.	8	6	2	2	2	2	5	3	7	6	7	8	1	5
	Xenochironomus xenolabis	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Diptera	*Antocha* sp.	0	0	1	0	0	0	5	0	0	0	1	0	2	3
	Atherix sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Atrichopogon sp.	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Ceratopogoninae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Empididae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ephydridae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Forcipomyia sp.	0	0	0	0	0	0	0	0	0	0	1	0	1	0
	Hemerodromia sp.	1	1	1	0	0	0	4	3	0	0	0	5	3	0
	Limonia sp.	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Muscidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pericoma/Telmatoscopus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Psychodidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Sciomyzidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Simulium sp.	45	49	23	31	40	47	4	5	5	14	2	4	0	1
	Stilobezzia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Tipula sp.	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Tipulidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Trichoptera	*Apatania* sp.	0	0	2	0	2	0	0	1	1	2	3	3	1	1
	Brachycentrus appalachia	0	0	0	0	0	0	0	0	0	0	1	1	2	0
	Brachycentrus numerosus	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ceraclea sp.	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Cheumatopsyche sp.	114	68	40	72	70	110	64	112	48	70	48	54	28	52
	Chimarra aterrima	0	5	0	0	0	0	22	18	72	15	24	20	48	56
	Chimarra obscura	26	71	25	34	26	76	0	0	0	0	0	0	1	0
	Chimarra socia	38	26	27	28	12	11	11	58	84	153	6	10	29	21

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Data are NOT adjusted for subsampling

	Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
	Sampling Method	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick
	Device	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame
	Habitat	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle
	Collection Date	08-01-2007	08-01-2007	08-01-2007	08-01-2007	07-31-2007	07-31-2007	07-31-2007	07-31-2007	07-31-2007	07-31-2007	07-30-2007	07-30-2007	07-30-2007	07-30-2007
	Percent Subsampled	16.67	10.42	20.83	33.33	14.58	11.45	20.83	16.67	12.50	8.33	23.98	39.53	13.55	25.00
	EcoAnalysts Sample ID	892.1-13	892.1-14	892.1-11	892.1-12	892.1-9	892.1-10	892.1-7	892.1-8	892.1-5	892.1-6	892.1-3	892.1-4	892.1-1	892.1-2
	Chimarra sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Culoptila sp.	0	0	0	0	0	0	0	0	2	1	1	0	3	4
	Diplectrona sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dolophilodes sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Goera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hydropsyche betteni	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Helicopsyche borealis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hydropsyche bronta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hydropsyche leonardi	3	3	9	5	2	3	0	0	0	0	0	0	0	0
	Hydropsyche morosa	43	37	14	24	27	55	109	86	49	87	28	53	15	18
	Hydropsyche scalaris	0	0	0	26	0	0	0	0	0	0	0	0	0	0
	Hydropsyche slossonae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hydropsyche sp.	1	1	7	0	4	0	2	1	1	2	0	0	0	0
	Hydropsyche sparna	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Hydroptila sp.	1	3	2	6	0	0	5	1	0	0	1	0	2	1
	Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lepidostoma sp.	0	0	5	4	3	0	1	0	3	0	5	4	2	4
	Leucotrichia pictipes	43	59	25	49	3	1	2	0	0	1	1	3	0	0
	Limnephilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lype diversa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Macrostemum sp.	2	0	5	4	0	1	2	1	0	0	4	2	0	0
	Micrasema sp.	0	0	0	0	1	0	1	0	0	0	0	2	0	0
	Mystacides sepulchralis	0	0	2	0	2	0	4	0	0	0	6	0	5	0
	Neophylax fuscus	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Neureclipsis sp.	5	14	7	2	6	1	6	3	1	0	7	6	7	3
	Nyctiophylax sp.	0	0	0	1	0	0	0	0	0	0	0	1	0	0
	Oecetis furva gr.	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Oecetis persimilis	3	0	5	3	0	0	1	1	0	0	0	0	12	2
	Oecetis sp.	0	0	0	0	1	0	0	0	0	0	2	0	0	0

Palmerton Benthos 2007 Lehigh Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Phylocentropus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Polycentropodidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Polycentropus sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Protoptila sp.	17	5	23	36	10	20	8	7	9	6	0	1	0	2
	Psychomyia flavida	0	0	0	1	0	0	3	1	0	0	0	3	0	9
	Psychomyia nomada	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pycnopsyche sp.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Rhyacophila formosa	0	0	0	0	0	0	0	1	1	0	4	2	0	0
	Rhyacophila fuscula	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Rhyacophila mainensis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Rhyacophila minora	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Rhyacophila sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Petrophila sp.	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Gastropoda	*Amnicola* sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ancylidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ferrissia sp.	0	0	0	0	0	0	0	0	1	0	2	1	3	1
	Fossaria sp.	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	2	0	0	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	2	0	0	0	0	0	0	0	0	0
	Hydrobiidae	0	0	0	0	2	0	0	0	0	0	7	0	15	0
	Lymnaeidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Micromenetus sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Physa sp.	2	3	30	6	84	0	16	0	10	2	29	1	30	0
	Planorbidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Bivalvia	*Pisidium* sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Sphaeriidae	0	0	0	1	0	0	4	1	0	0	8	4	2	0
	Sphaerium sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Annelida	*Aulodrilus limnobius*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Dero furcata	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Enchytraeidae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Palmerton Benthos 2007 Lehigh Creek Taxa

Data are NOT adjusted for subsampling

	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Erpobdellidae	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Glossiphoniidae	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Lumbriculidae	0	0	0	0	1	0	0	0	1	0	8	1	2	1
	Manayunkia speciosa	0	0	0	0	0	0	0	0	0	0	1	0	4	1
	Nais behningi	0	0	0	0	0	0	0	0	0	0	1	0	2	2
	Nais bretscheri	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nais communis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nais simplex	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nais sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Nais variabilis	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pristina jenkinae	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Pristina osborni	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Tubificidae w/ cap setae	1	0	0	0	1	0	3	0	0	0	0	0	0	0
	Tubificidae w/o cap setae	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Acari	Acari	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Arrenurus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Atractides sp.	1	2	1	0	0	0	0	1	1	1	0	0	0	0
	Aturus sp.	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Clathrosperchon sp.	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	1	1	0	2	0	0	0	0	0	0	1
	Lebertia sp.	2	2	0	2	0	0	2	4	1	0	7	6	1	3
	Limnesia sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Mideopsis sp.	0	0	1	0	0	0	0	0	0	0	0	0	1	0
	Neumania sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Oribatei	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Protzia sp.	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Sperchon sp.	1	1	0	0	0	0	2	3	1	1	2	1	0	2
	Sperchonopsis sp.	0	0	0	0	0	0	0	0	0	0	0	2	0	0

Palmerton Benthos 2007 Lehigh Creek Taxa															
Data are NOT adjusted for subsampling															
	Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
	Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
	Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
	Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
	Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
	Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
	EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
	Torrenticola sp.	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Crustacea	*Caecidotea* sp.	0	0	0	0	3	0	1	0	0	0	0	0	2	0
	Cambarus bartonii	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Cambarus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Crangonyx sp.	0	0	0	0	0	0	1	0	0	0	0	0	1	0
	Gammarus sp.	0	2	7	2	39	0	0	0	0	0	0	0	0	0
	Hyalella sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Orconectes sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Ostracoda	0	0	2	0	0	0	1	1	1	0	0	1	0	0
	Stygobromus sp.	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other Organisms	Nematoda	15	7	14	23	7	4	3	2	5	3	0	11	3	1
	Prostoma sp.	2	1	24	4	1	0	5	3	11	4	3	0	2	5
	Turbellaria	2	1	0	0	1	1	1	1	4	0	0	1	1	0
	TOTAL	**625**	**566**	**511**	**546**	**541**	**535**	**556**	**524**	**538**	**541**	**596**	**615**	**501**	**611**

Palmerton Benthos 2007 Lehigh River Metrics

Data are adjusted for subsampling

Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
Abundance Measures														
Corrected Abundance	3750.00	5433.60	2452.80	1638.00	3711.26	4670.55	2668.80	3144.00	4304.00	6492.00	2485.32	1555.95	3697.38	2444.00
EPT Abundance	2256.00	3696.00	1320.00	1098.00	1721.86	3177.72	1948.80	2358.00	3120.00	5316.00	1413.63	946.22	2103.30	1564.00
Dominance Measures														
Dominant Taxon	*Stenelmis* sp.	*Stenelmis* sp.	*Stenelmis* sp.	*Stenelmis* sp.	*Physa* sp.	*Cheumatopsyche* sp.	*Hydropsyche morosa*	*Cheumatopsyche* sp.	*Chimarra socia*	*Chimarra socia*	*Baetis intercalaris*	*Stenelmis* sp.	*Baetis intercalaris*	*Baetis intercalaris*
Dominant Abundance	876.00	883.20	360.00	267.00	576.24	960.30	523.20	672.00	672.00	1836.00	329.43	240.35	442.80	376.00
2nd Dominant Taxon	*Cheumatopsyche* sp.	*Chimarra obscura*	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.	*Stenelmis* sp.	*Stenelmis* sp.	*Baetis intercalaris*	*Hydropsyche morosa*	*Chimarra aterrima*	*Hydropsyche morosa*	*Stenelmis* sp.	*Baetis intercalaris*	*Chimarra aterrima*	*Stenelmis* sp.
2nd Dominant Abundance	684.00	681.60	192.00	216.00	535.08	829.35	312.00	516.00	576.00	1044.00	321.09	202.40	354.24	368.00
3rd Dominant Taxon	*Simulium* sp.	*Cheumatopsyche* sp.	*Baetis intercalaris*	*Leucotrichia pictipes*	*Cheumatopsyche* sp.	*Chimarra obscura*	*Cheumatopsyche* sp.	*Stenelmis* sp.	*Stenelmis* sp.	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.	*Stenelmis* sp.	*Chimarra aterrima*
3rd Dominant Abundance	270.00	652.80	187.20	147.00	480.20	663.48	307.20	354.00	512.00	840.00	200.16	136.62	317.34	224.00
% Dominant Taxon	23.36	16.25	14.68	16.30	15.53	20.56	19.60	21.37	15.61	28.28	13.26	15.45	11.98	15.38
% 2 Dominant Taxa	41.60	28.80	22.50	29.49	29.94	38.32	31.29	37.79	29.00	44.36	26.17	28.46	21.56	30.44
% 3 Dominant Taxa	48.80	40.81	30.14	38.46	42.88	52.52	42.81	49.05	40.89	57.30	34.23	37.24	30.14	39.61
Richness Measures														
Species Richness	39.00	39.00	49.00	41.00	51.00	28.00	66.00	46.00	47.00	36.00	77.00	62.00	75.00	59.00
EPT Richness	19.00	19.00	24.00	21.00	25.00	17.00	31.00	24.00	24.00	21.00	31.00	30.00	28.00	27.00
Ephemeroptera Richness	5.00	6.00	7.00	5.00	8.00	7.00	14.00	9.00	10.00	9.00	12.00	11.00	10.00	12.00
Plecoptera Richness	2.00	2.00	1.00	1.00	3.00	1.00	2.00	1.00	3.00	3.00	3.00	2.00	4.00	3.00
Trichoptera Richness	12.00	11.00	16.00	15.00	14.00	9.00	15.00	14.00	11.00	9.00	16.00	17.00	14.00	12.00
Chironomidae Richness	5.00	4.00	10.00	5.00	4.00	5.00	10.00	6.00	8.00	3.00	19.00	13.00	14.00	14.00
Oligochaeta Richness	1.00	0.00	0.00	0.00	2.00	0.00	1.00	0.00	1.00	1.00	2.00	1.00	3.00	2.00
Non-Chiro. Non-Olig. Richness	33.00	35.00	39.00	36.00	45.00	23.00	55.00	40.00	38.00	32.00	56.00	48.00	58.00	43.00
Rhyacophila Richness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00

Palmerton Benthos 2007 Lehigh River Metrics

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Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Sampling Method	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick	Jab	Kick
Device	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame	D-frame
Habitat	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle	Multi	Riffle
Collection Date	08-01-2007	08-01-2007	08-01-2007	08-01-2007	07-31-2007	07-31-2007	07-31-2007	07-31-2007	07-31-2007	07-31-2007	07-30-2007	07-30-2007	07-30-2007	07-30-2007
Percent Subsampled	16.67	10.42	20.83	33.33	14.58	11.45	20.83	16.67	12.50	8.33	23.98	39.53	13.55	25.00
EcoAnalysts Sample ID	892.1-13	892.1-14	892.1-11	892.1-12	892.1-9	892.1-10	892.1-7	892.1-8	892.1-5	892.1-6	892.1-3	892.1-4	892.1-1	892.1-2
Community Composition														
% Ephemeroptera	12.48	15.72	14.68	12.82	14.42	15.89	28.78	17.94	20.45	18.30	31.38	31.71	23.75	33.72
% Plecoptera	0.32	0.71	0.20	0.18	0.74	0.19	0.90	1.34	1.67	1.29	1.68	1.95	2.00	1.96
% Trichoptera	47.36	51.59	38.94	54.03	31.24	51.96	43.35	55.73	50.37	62.29	23.83	27.15	31.14	28.31
% EPT	60.16	68.02	53.82	67.03	46.40	68.04	73.02	75.00	72.49	81.89	56.88	60.81	56.89	63.99
% Coleoptera	25.60	17.31	15.66	17.95	17.74	20.93	10.61	15.65	16.91	11.46	22.32	26.34	16.77	19.48
% Diptera	9.92	10.78	14.87	7.51	8.32	10.09	8.63	5.92	3.90	4.25	8.72	7.64	10.58	13.42
% Oligochaeta	0.16	0.00	0.00	0.00	0.37	0.00	0.54	0.00	0.19	0.18	1.51	0.16	1.20	0.49
% Baetidae	12.48	15.55	14.09	12.64	13.68	15.51	19.42	13.17	15.24	14.79	25.17	24.72	19.56	26.84
% Brachycentridae	0.00	0.00	0.00	0.00	0.18	0.00	0.18	0.00	0.00	0.00	0.17	0.49	0.40	0.00
% Chironomidae	2.56	1.94	9.98	1.83	0.92	1.31	5.94	4.39	2.97	1.66	8.05	6.18	9.18	12.77
% Ephemerellidae	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.19	0.19	0.18	0.00	0.16	0.00	0.16
% Hydropsychidae	26.08	19.26	14.68	23.99	19.04	31.59	31.83	38.17	18.22	29.39	13.42	17.89	8.58	11.46
% Odonata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.40	0.00
% Perlidae	0.32	0.71	0.20	0.18	0.74	0.19	0.90	1.34	1.67	1.11	1.68	1.95	1.80	1.80
% Pteronarcyidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Simuliidae	7.20	8.66	4.50	5.68	7.39	8.79	0.72	0.95	0.93	2.59	0.34	0.65	0.00	0.16
Functional Group Composition														
% Filterers	38.88	43.99	31.12	36.81	32.53	54.95	41.37	46.37	35.13	36.41	23.32	26.50	24.35	25.70
% Gatherers	11.04	12.37	16.63	12.45	17.74	9.53	27.70	16.60	16.17	12.75	31.54	35.61	27.94	36.17
% Predators	4.96	4.24	10.18	6.59	3.88	1.31	5.04	5.92	6.69	3.33	7.21	7.48	11.18	6.38
% Scrapers	28.00	18.37	27.01	25.09	35.49	22.24	17.63	15.65	21.93	13.49	28.36	24.72	25.35	21.93
% Shredders	0.00	0.18	1.96	1.83	0.74	0.37	2.34	0.38	0.93	0.18	4.36	2.76	3.39	5.56
% Piercer-Herbivores	7.04	10.95	5.28	10.07	0.55	0.19	1.26	0.19	0.00	0.18	0.34	0.49	0.40	0.16
% Unclassified	4.00	5.30	2.54	2.01	6.84	9.35	2.70	3.82	3.53	5.36	3.69	0.81	1.60	0.65
Filterer Richness	9.00	9.00	9.00	10.00	8.00	8.00	11.00	9.00	9.00	6.00	13.00	13.00	12.00	12.00
Gatherer Richness	8.00	7.00	15.00	8.00	12.00	8.00	21.00	13.00	10.00	9.00	17.00	15.00	18.00	16.00
Predator Richness	11.00	11.00	9.00	8.00	14.00	4.00	13.00	12.00	11.00	8.00	14.00	13.00	21.00	12.00
Scraper Richness	6.00	7.00	9.00	7.00	11.00	4.00	11.00	7.00	11.00	9.00	15.00	11.00	12.00	11.00

Palmerton Benthos 2007 Lehigh River Metrics

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Site ID	LR00	LR00	LR01	LR01	LR02	LR02	LR03	LR03	LR03.5	LR03.5	LR04	LR04	LR05	LR05
Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
Shredder Richness	0.00	1.00	3.00	4.00	2.00	1.00	6.00	1.00	3.00	1.00	9.00	6.00	8.00	5.00
Piercer-Herbivore Richness	2.00	2.00	2.00	2.00	1.00	1.00	2.00	1.00	0.00	1.00	2.00	1.00	1.00	1.00
Unclassified	2.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	2.00	1.00	5.00	2.00	2.00	1.00
Diversity/Evenness Measures														
Shannon-Weaver H' (log 10)	1.15	1.19	1.39	1.25	1.25	1.03	1.40	1.19	1.27	1.08	1.50	1.38	1.52	1.36
Shannon-Weaver H' (log 2)	3.80	3.96	4.61	4.14	4.17	3.43	4.65	3.95	4.22	3.60	4.97	4.58	5.06	4.52
Shannon-Weaver H' (log e)	2.64	2.75	3.20	2.87	2.89	2.38	3.23	2.74	2.93	2.50	3.45	3.17	3.50	3.13
Margalef's Richness	4.62	4.42	6.15	5.40	6.08	3.20	8.24	5.59	5.50	3.99	9.72	8.30	9.01	7.43
Pielou's J'	0.72	0.75	0.82	0.77	0.73	0.71	0.77	0.72	0.76	0.70	0.79	0.77	0.81	0.77
Simpson's Heterogeneity	0.89	0.91	0.94	0.92	0.91	0.88	0.92	0.89	0.92	0.86	0.94	0.93	0.95	0.93
Biotic Indices														
% Indiv. w/ HBI Value	79.20	76.15	84.54	80.95	87.62	86.54	89.93	81.87	76.77	64.88	90.94	92.85	88.42	89.85
Hilsenhoff Biotic Index	4.93	4.94	5.24	4.54	5.54	4.71	5.02	4.93	4.71	4.95	4.94	4.70	5.05	4.71
% Indiv. w/ MTI Value	66.56	51.24	51.66	54.76	58.41	66.54	50.18	60.50	42.75	48.06	46.14	54.96	36.73	43.54
Metals Tolerance Index	4.10	4.19	3.66	3.87	3.72	4.19	4.38	4.34	3.94	4.34	3.64	3.83	3.71	3.74
% Indiv. w/ FSBI Value	28.64	23.67	16.83	20.33	24.03	31.03	18.35	26.53	14.13	19.78	18.12	21.79	11.78	17.02
Fine Sediment Biotic Index	33.00	33.00	50.00	16.00	34.00	15.00	55.00	48.00	38.00	38.00	43.00	45.00	49.00	43.00
FSBI - average	0.85	0.85	1.02	0.39	0.67	0.54	0.83	1.04	0.81	1.06	0.56	0.73	0.65	0.73
FSBI - weighted average	2.53	2.77	3.02	2.51	2.68	2.46	3.08	2.59	3.08	2.91	3.70	3.57	3.49	3.63
% Indiv. w/ TPM Value	34.40	27.21	28.77	28.02	26.25	32.52	23.56	38.55	30.30	46.95	17.45	18.54	20.56	25.70
Temp. Pref. Metric - average	0.64	0.49	0.78	0.68	0.59	0.43	0.71	0.63	0.77	0.58	0.84	0.97	0.57	1.02
TPM - weighted average	1.81	2.17	1.97	1.85	2.39	2.06	1.75	1.23	0.92	0.73	1.88	1.99	1.25	1.78
Karr BIBI Metrics														
Long-Lived Taxa Richness	2.00	3.00	2.00	2.00	3.00	1.00	5.00	3.00	2.00	2.00	4.00	5.00	7.00	5.00
Clinger Richness	21.00	22.00	25.00	21.00	25.00	15.00	30.00	21.00	26.00	21.00	38.00	34.00	34.00	32.00
% Clingers	71.68	60.78	64.58	62.64	70.98	68.60	71.76	66.60	53.90	55.64	71.14	73.01	59.48	70.05
Intolerant Taxa Richness	4.00	4.00	5.00	7.00	9.00	4.00	12.00	8.00	10.00	9.00	13.00	14.00	13.00	15.00
% Tolerant Individuals	0.17	0.10	2.70	0.75	2.92	0.00	1.08	0.19	0.70	0.17	1.86	0.21	1.19	0.27

Palmerton Benthos 2007 Lehigh River Metrics

Data are adjusted for subsampling

Site ID	**LR00**	**LR00**	**LR01**	**LR01**	**LR02**	**LR02**	**LR03**	**LR03**	**LR03.5**	**LR03.5**	**LR04**	**LR04**	**LR05**	**LR05**
Sampling Method	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**	**Jab**	**Kick**
Device	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**	**D-frame**
Habitat	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**	**Multi**	**Riffle**
Collection Date	**08-01-2007**	**08-01-2007**	**08-01-2007**	**08-01-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-31-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**	**07-30-2007**
Percent Subsampled	**16.67**	**10.42**	**20.83**	**33.33**	**14.58**	**11.45**	**20.83**	**16.67**	**12.50**	**8.33**	**23.98**	**39.53**	**13.55**	**25.00**
EcoAnalysts Sample ID	**892.1-13**	**892.1-14**	**892.1-11**	**892.1-12**	**892.1-9**	**892.1-10**	**892.1-7**	**892.1-8**	**892.1-5**	**892.1-6**	**892.1-3**	**892.1-4**	**892.1-1**	**892.1-2**
% Tolerant Taxa	7.69	5.13	14.29	4.88	19.61	0.00	9.09	6.52	10.64	8.33	9.09	6.45	10.67	3.39
Coleoptera Richness	4.00	4.00	4.00	5.00	4.00	3.00	6.00	4.00	4.00	4.00	11.00	5.00	8.00	5.00

APPENDIX 4. 2006-2007 Chlorophyll Analysis and Ash Free Dry Mass Data

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek
Chlorophyll Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	PrepMethod	Preservative
MC01	Rock Scrape	10-09-2006	889-6	E0603571	Solid - Wet Weight	Chlorophyll A	249	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
MC01	Rock Scrape	10-09-2006	889-6	E0603571	Solid - Wet Weight	Chlorophyll B	86.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
MC01	Rock Scrape	10-09-2006	889-6	E0603571	Solid - Wet Weight	Chlorophyll C	19.7	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
MC01	Rock Scrape	10-09-2006	889-6	E0603571	Solid - Wet Weight	Pheophytin	188	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Rock Scrape	10-09-2006	889-4	E0603569	Solid - Wet Weight	Chlorophyll A	363	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Rock Scrape	10-09-2006	889-4	E0603569	Solid - Wet Weight	Chlorophyll B	49.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Rock Scrape	10-09-2006	889-4	E0603569	Solid - Wet Weight	Chlorophyll C	23.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Rock Scrape	10-09-2006	889-4	E0603569	Solid - Wet Weight	Pheophytin	130	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	10-30-2006	889-35	E0603961	Solid - Wet Weight	Chlorophyll A	19.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	10-30-2006	889-35	E0603961	Solid - Wet Weight	Chlorophyll B	1.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	10-30-2006	889-35	E0603961	Solid - Wet Weight	Chlorophyll C	2.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	10-30-2006	889-35	E0603961	Solid - Wet Weight	Pheophytin	5.7	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Rock Scrape	10-09-2006	889-5	E0603570	Solid - Wet Weight	Chlorophyll A	216	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Rock Scrape	10-09-2006	889-5	E0603570	Solid - Wet Weight	Chlorophyll B	17.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Rock Scrape	10-09-2006	889-5	E0603570	Solid - Wet Weight	Chlorophyll C	9.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Rock Scrape	10-09-2006	889-5	E0603570	Solid - Wet Weight	Pheophytin	39.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Diatometer	08-16-2007	5053-60	E0702983A	Solid - Wet Weight	Chlorophyll A	3.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Diatometer	08-16-2007	5053-60	E0702983A	Solid - Wet Weight	Chlorophyll B	0.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Diatometer	08-16-2007	5053-60	E0702983A	Solid - Wet Weight	Chlorophyll C	0.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC09	Diatometer	08-16-2007	5053-60	E0702983A	Solid - Wet Weight	Pheophytin	1.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	08-16-2007	5053-61	E0702982A	Solid - Wet Weight	Chlorophyll A	6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	08-16-2007	5053-61	E0702982A	Solid - Wet Weight	Chlorophyll B	0.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	08-16-2007	5053-61	E0702982A	Solid - Wet Weight	Chlorophyll C	0.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
BC10	Diatometer	08-16-2007	5053-61	E0702982A	Solid - Wet Weight	Pheophytin	1.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze

Palmerton Periphyton 2006 Aquashicola Creek
Chlorophyll Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	PrepMethod	Preservative
AC01	Rock Scrape	10-11-2006	889-7	E0603620	Solid – Wet Weight	Chlorophyll A	452	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Rock Scrape	10-11-2006	889-7	E0603620	Solid – Wet Weight	Chlorophyll B	112	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Rock Scrape	10-11-2006	889-7	E0603620	Solid – Wet Weight	Chlorophyll C	20.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Rock Scrape	10-11-2006	889-7	E0603620	Solid – Wet Weight	Pheophytin	128	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/AC03	Rock Scrape	10-11-2006	889-8	E0603621	Solid – Wet Weight	Chlorophyll A	368	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/AC03	Rock Scrape	10-11-2006	889-8	E0603621	Solid – Wet Weight	Chlorophyll B	88.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/AC03	Rock Scrape	10-11-2006	889-8	E0603621	Solid – Wet Weight	Chlorophyll C	16.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/AC03	Rock Scrape	10-11-2006	889-8	E0603621	Solid – Wet Weight	Pheophytin	78.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	10-30-2006	889-39	E0603962	Solid – Wet Weight	Chlorophyll A	13.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	10-30-2006	889-39	E0603962	Solid – Wet Weight	Chlorophyll B	1.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	10-30-2006	889-39	E0603962	Solid – Wet Weight	Chlorophyll C	2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	10-30-2006	889-39	E0603962	Solid – Wet Weight	Pheophytin	5.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	10-10-2006	889-9	E0603622	Solid – Wet Weight	Chlorophyll A	215	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	10-10-2006	889-9	E0603622	Solid – Wet Weight	Chlorophyll B	11.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	10-10-2006	889-9	E0603622	Solid – Wet Weight	Chlorophyll C	12.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	10-10-2006	889-9	E0603622	Solid – Wet Weight	Pheophytin	56.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	10-30-2006	889-40	E0603963	Solid – Wet Weight	Chlorophyll A	17.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	10-30-2006	889-40	E0603963	Solid – Wet Weight	Chlorophyll B	2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	10-30-2006	889-40	E0603963	Solid – Wet Weight	Chlorophyll C	2.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	10-30-2006	889-40	E0603963	Solid – Wet Weight	Pheophytin	7.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	10-10-2006	889-10	E0603623	Solid – Wet Weight	Chlorophyll A	239	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	10-10-2006	889-10	E0603623	Solid – Wet Weight	Chlorophyll B	35.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	10-10-2006	889-10	E0603623	Solid – Wet Weight	Chlorophyll C	16.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	10-10-2006	889-10	E0603623	Solid – Wet Weight	Pheophytin	65.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	10-30-2006	889-31	E0603959	Solid – Wet Weight	Chlorophyll A	14.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	10-30-2006	889-31	E0603959	Solid – Wet Weight	Chlorophyll B	1.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	10-30-2006	889-31	E0603959	Solid – Wet Weight	Chlorophyll C	1.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	10-30-2006	889-31	E0603959	Solid – Wet Weight	Pheophytin	3.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	10-10-2006	889-1	E0603566	Solid – Wet Weight	Chlorophyll A	215	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	10-10-2006	889-1	E0603566	Solid – Wet Weight	Chlorophyll B	23.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	10-10-2006	889-1	E0603566	Solid – Wet Weight	Chlorophyll C	7.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	10-10-2006	889-1	E0603566	Solid – Wet Weight	Pheophytin	65.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	10-30-2006	889-32	E0603960	Solid – Wet Weight	Chlorophyll A	28.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	10-30-2006	889-32	E0603960	Solid – Wet Weight	Chlorophyll B	0.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	10-30-2006	889-32	E0603960	Solid – Wet Weight	Chlorophyll C	2.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	10-30-2006	889-32	E0603960	Solid – Wet Weight	Pheophytin	11.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Rock Scrape	10-10-2006	889-2	E0603567	Solid – Wet Weight	Chlorophyll A	209	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Rock Scrape	10-10-2006	889-2	E0603567	Solid – Wet Weight	Chlorophyll B	18.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Rock Scrape	10-10-2006	889-2	E0603567	Solid – Wet Weight	Chlorophyll C	7.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Rock Scrape	10-10-2006	889-2	E0603567	Solid – Wet Weight	Pheophytin	71.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Rock Scrape	10-09-2006	889-3	E0603568	Solid – Wet Weight	Chlorophyll A	485	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Rock Scrape	10-09-2006	889-3	E0603568	Solid – Wet Weight	Chlorophyll B	29.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Rock Scrape	10-09-2006	889-3	E0603568	Solid – Wet Weight	Chlorophyll C	24.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Rock Scrape	10-09-2006	889-3	E0603568	Solid – Wet Weight	Pheophytin	109	µg	0.1	EPA 446.0	Acetone Extraction	Freeze

Palmerton Periphyton 2007 Aquashicola Creek
Chlorophyll Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	PrepMethod	Preservative
AC01	Diatometer	08-16-2007	5053-53	E0702975A	Solid - Wet Weight	Chlorophyll A	2.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Diatometer	08-16-2007	5053-53	E0702975A	Solid - Wet Weight	Chlorophyll B	1.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Diatometer	08-16-2007	5053-53	E0702975A	Solid - Wet Weight	Chlorophyll C	0.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Diatometer	08-16-2007	5053-53	E0702975A	Solid - Wet Weight	Pheophytin	0.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Rock Scrape	08-02-2007	5053-13	E0702787	Solid - Wet Weight	Chlorophyll A	2030	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Rock Scrape	08-02-2007	5053-13	E0702787	Solid - Wet Weight	Chlorophyll B	596	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Rock Scrape	08-02-2007	5053-13	E0702787	Solid - Wet Weight	Chlorophyll C	50.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC01	Rock Scrape	08-02-2007	5053-13	E0702787	Solid - Wet Weight	Pheophytin	489	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Diatometer	08-16-2007	5053-54	E0702976A	Solid - Wet Weight	Chlorophyll A	3.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Diatometer	08-16-2007	5053-54	E0702976A	Solid - Wet Weight	Chlorophyll B	0.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Diatometer	08-16-2007	5053-54	E0702976A	Solid - Wet Weight	Chlorophyll C	0.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Diatometer	08-16-2007	5053-54	E0702976A	Solid - Wet Weight	Pheophytin	1.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Rock Scrape	08-02-2007	5053-14	E0702788	Solid - Wet Weight	Chlorophyll A	413	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Rock Scrape	08-02-2007	5053-14	E0702788	Solid - Wet Weight	Chlorophyll B	71.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Rock Scrape	08-02-2007	5053-14	E0702788	Solid - Wet Weight	Chlorophyll C	9.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC02/03	Rock Scrape	08-02-2007	5053-14	E0702788	Solid - Wet Weight	Pheophytin	94.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	08-16-2007	5053-55	E0702977A	Solid - Wet Weight	Chlorophyll A	1.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	08-16-2007	5053-55	E0702977A	Solid - Wet Weight	Chlorophyll B	0.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	08-16-2007	5053-55	E0702977A	Solid - Wet Weight	Chlorophyll C	0.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Diatometer	08-16-2007	5053-55	E0702977A	Solid - Wet Weight	Pheophytin	0.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	08-02-2007	5053-15	E0702789	Solid - Wet Weight	Chlorophyll A	352	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	08-02-2007	5053-15	E0702789	Solid - Wet Weight	Chlorophyll B	35.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	08-02-2007	5053-15	E0702789	Solid - Wet Weight	Chlorophyll C	4.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC04	Rock Scrape	08-02-2007	5053-15	E0702789	Solid - Wet Weight	Pheophytin	59.7	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	08-16-2007	5053-56	E0702978A	Solid - Wet Weight	Chlorophyll A	4.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	08-16-2007	5053-56	E0702978A	Solid - Wet Weight	Chlorophyll B	0.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	08-16-2007	5053-56	E0702978A	Solid - Wet Weight	Chlorophyll C	0.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Diatometer	08-16-2007	5053-56	E0702978A	Solid - Wet Weight	Pheophytin	1.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	08-02-2007	5053-16	E0702790	Solid - Wet Weight	Chlorophyll A	380	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	08-02-2007	5053-16	E0702790	Solid - Wet Weight	Chlorophyll B	22.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	08-02-2007	5053-16	E0702790	Solid - Wet Weight	Chlorophyll C	1.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC05	Rock Scrape	08-02-2007	5053-16	E0702790	Solid - Wet Weight	Pheophytin	70.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	08-16-2007	5053-57	E0702979A	Solid - Wet Weight	Chlorophyll A	14.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	08-16-2007	5053-57	E0702979A	Solid - Wet Weight	Chlorophyll B	< 0.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	08-16-2007	5053-57	E0702979A	Solid - Wet Weight	Chlorophyll C	0.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Diatometer	08-16-2007	5053-57	E0702979A	Solid - Wet Weight	Pheophytin	2.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	08-01-2007	5053-17	E0702791	Solid - Wet Weight	Chlorophyll A	90.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	08-01-2007	5053-17	E0702791	Solid - Wet Weight	Chlorophyll B	3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	08-01-2007	5053-17	E0702791	Solid - Wet Weight	Chlorophyll C	3.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC06	Rock Scrape	08-01-2007	5053-17	E0702791	Solid - Wet Weight	Pheophytin	14.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	08-16-2007	5053-58	E0702980A	Solid - Wet Weight	Chlorophyll A	5.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	08-16-2007	5053-58	E0702980A	Solid - Wet Weight	Chlorophyll B	0.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	08-16-2007	5053-58	E0702980A	Solid - Wet Weight	Chlorophyll C	1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC07	Diatometer	08-16-2007	5053-58	E0702980A	Solid - Wet Weight	Pheophytin	1.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Diatometer	08-16-2007	5053-59	E0702981A	Solid - Wet Weight	Chlorophyll A	12.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Diatometer	08-16-2007	5053-59	E0702981A	Solid - Wet Weight	Chlorophyll B	0.7	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Diatometer	08-16-2007	5053-59	E0702981A	Solid - Wet Weight	Chlorophyll C	0.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
AC08	Diatometer	08-16-2007	5053-59	E0702981A	Solid - Wet Weight	Pheophytin	1.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze

Palmerton Periphyton 2007 Lehigh River
Chlorophyll Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	PrepMethod	Preservative
LR00	Diatometer	08-16-2007	5053-62	E0702990A	Solid - Wet Weight	Chlorophyll A	19.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR00	Diatometer	08-16-2007	5053-62	E0702990A	Solid - Wet Weight	Chlorophyll B	2.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR00	Diatometer	08-16-2007	5053-62	E0702990A	Solid - Wet Weight	Chlorophyll C	1.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR00	Diatometer	08-16-2007	5053-62	E0702990A	Solid - Wet Weight	Pheophytin	2.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR00	Rock Scrape	08-01-2007	5053-18	E0702792	Solid - Wet Weight	Chlorophyll A	212	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR00	Rock Scrape	08-01-2007	5053-18	E0702792	Solid - Wet Weight	Chlorophyll B	38.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR00	Rock Scrape	08-01-2007	5053-18	E0702792	Solid - Wet Weight	Chlorophyll C	8.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR00	Rock Scrape	08-01-2007	5053-18	E0702792	Solid - Wet Weight	Pheophytin	34.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Diatometer	08-16-2007	5053-63	E0702989A	Solid - Wet Weight	Chlorophyll A	4.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Diatometer	08-16-2007	5053-63	E0702989A	Solid - Wet Weight	Chlorophyll B	0.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Diatometer	08-16-2007	5053-63	E0702989A	Solid - Wet Weight	Chlorophyll C	0.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Diatometer	08-16-2007	5053-63	E0702989A	Solid - Wet Weight	Pheophytin	1.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Rock Scrape	08-01-2007	5053-19	E0702793	Solid - Wet Weight	Chlorophyll A	537	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Rock Scrape	08-01-2007	5053-19	E0702793	Solid - Wet Weight	Chlorophyll B	55	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Rock Scrape	08-01-2007	5053-19	E0702793	Solid - Wet Weight	Chlorophyll C	15.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR01	Rock Scrape	08-01-2007	5053-19	E0702793	Solid - Wet Weight	Pheophytin	137	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Diatometer	08-16-2007	5053-64	E0702988A	Solid - Wet Weight	Chlorophyll A	5.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Diatometer	08-16-2007	5053-64	E0702988A	Solid - Wet Weight	Chlorophyll B	0.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Diatometer	08-16-2007	5053-64	E0702988A	Solid - Wet Weight	Chlorophyll C	0.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Diatometer	08-16-2007	5053-64	E0702988A	Solid - Wet Weight	Pheophytin	2.2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Rock Scrape	07-31-2007	5053-20	E0702794	Solid - Wet Weight	Chlorophyll A	189	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Rock Scrape	07-31-2007	5053-20	E0702794	Solid - Wet Weight	Chlorophyll B	24.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Rock Scrape	07-31-2007	5053-20	E0702794	Solid - Wet Weight	Chlorophyll C	1.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR02	Rock Scrape	07-31-2007	5053-20	E0702794	Solid - Wet Weight	Pheophytin	19.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Diatometer	08-16-2007	5053-65	E0702987A	Solid - Wet Weight	Chlorophyll A	2	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Diatometer	08-16-2007	5053-65	E0702987A	Solid - Wet Weight	Chlorophyll B	0.9	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Diatometer	08-16-2007	5053-65	E0702987A	Solid - Wet Weight	Chlorophyll C	< 0.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Diatometer	08-16-2007	5053-65	E0702987A	Solid - Wet Weight	Pheophytin	0.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Rock Scrape	07-31-2007	5053-21	E0702795	Solid - Wet Weight	Chlorophyll A	2040	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Rock Scrape	07-31-2007	5053-21	E0702795	Solid - Wet Weight	Chlorophyll B	507	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Rock Scrape	07-31-2007	5053-21	E0702795	Solid - Wet Weight	Chlorophyll C	28.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03	Rock Scrape	07-31-2007	5053-21	E0702795	Solid - Wet Weight	Pheophytin	496	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Diatometer	08-16-2007	5053-66	E0702986A	Solid - Wet Weight	Chlorophyll A	< 0.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Diatometer	08-16-2007	5053-66	E0702986A	Solid - Wet Weight	Chlorophyll B	0.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Diatometer	08-16-2007	5053-66	E0702986A	Solid - Wet Weight	Chlorophyll C	0.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Diatometer	08-16-2007	5053-66	E0702986A	Solid - Wet Weight	Pheophytin	< 0.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Rock Scrape	07-31-2007	5053-22	E0702796	Solid - Wet Weight	Chlorophyll A	85.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Rock Scrape	07-31-2007	5053-22	E0702796	Solid - Wet Weight	Chlorophyll B	18.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Rock Scrape	07-31-2007	5053-22	E0702796	Solid - Wet Weight	Chlorophyll C	2.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR03.5	Rock Scrape	07-31-2007	5053-22	E0702796	Solid - Wet Weight	Pheophytin	10.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR04	Diatometer	08-16-2007	5053-67	E0702985A	Solid - Wet Weight	Chlorophyll A	2.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR04	Diatometer	08-16-2007	5053-67	E0702985A	Solid - Wet Weight	Chlorophyll B	0.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR04	Diatometer	08-16-2007	5053-67	E0702985A	Solid - Wet Weight	Chlorophyll C	1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR04	Diatometer	08-16-2007	5053-67	E0702985A	Solid - Wet Weight	Pheophytin	0.7	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR04	Rock Scrape	07-30-2007	5053-23	E0702797	Solid - Wet Weight	Chlorophyll A	181	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR04	Rock Scrape	07-30-2007	5053-23	E0702797	Solid - Wet Weight	Chlorophyll B	32.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR04	Rock Scrape	07-30-2007	5053-23	E0702797	Solid - Wet Weight	Chlorophyll C	3.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze

Palmerton Periphyton 2007 Lehigh River
Chlorophyll Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	PrepMethod	Preservative
LR04	Rock Scrape	07-30-2007	5053-23	E0702797	Solid - Wet Weight	Pheophytin	25.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Diatometer	08-16-2007	5053-68	E0702984A	Solid - Wet Weight	Chlorophyll A	2.4	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Diatometer	08-16-2007	5053-68	E0702984A	Solid - Wet Weight	Chlorophyll B	0.3	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Diatometer	08-16-2007	5053-68	E0702984A	Solid - Wet Weight	Chlorophyll C	0.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Diatometer	08-16-2007	5053-68	E0702984A	Solid - Wet Weight	Pheophytin	< 0.1	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Rock Scrape	07-30-2007	5053-24	E0702798	Solid - Wet Weight	Chlorophyll A	98.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Rock Scrape	07-30-2007	5053-24	E0702798	Solid - Wet Weight	Chlorophyll B	4.5	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Rock Scrape	07-30-2007	5053-24	E0702798	Solid - Wet Weight	Chlorophyll C	2.8	µg	0.1	EPA 446.0	Acetone Extraction	Freeze
LR05	Rock Scrape	07-30-2007	5053-24	E0702798	Solid - Wet Weight	Pheophytin	22.6	µg	0.1	EPA 446.0	Acetone Extraction	Freeze

Palmerton Periphyton 2006-2007 Mill Creek and Buckwha Creek
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
MC01	Rock Scrape	10-09-2006	889-26	E0603969	Solid - Wet Weight	Sample Analyzed	288	mL		Combustion/Gravimetric	N/A	Freeze
MC01	Rock Scrape	10-09-2006	889-26	E0603969	Solid - Wet Weight	Weight - Dry Material	2.02	grams		Combustion/Gravimetric	N/A	Freeze
MC01	Rock Scrape	10-09-2006	889-26	E0603969	Solid - Wet Weight	Ash-Free Dry Weight	1.2	grams	0.001	Combustion/Gravimetric	N/A	Freeze
BC09	Rock Scrape	10-09-2006	889-24	E0603967	Solid - Wet Weight	Sample Analyzed	171	mL		Combustion/Gravimetric	N/A	Freeze
BC09	Rock Scrape	10-09-2006	889-24	E0603967	Solid - Wet Weight	Weight - Dry Material	2.41	grams		Combustion/Gravimetric	N/A	Freeze
BC09	Rock Scrape	10-09-2006	889-24	E0603967	Solid - Wet Weight	Ash-Free Dry Weight	1.19	grams	0.001	Combustion/Gravimetric	N/A	Freeze
BC10	Rock Scrape	10-09-2006	889-25	E0603968	Solid - Wet Weight	Sample Analyzed	154	mL		Combustion/Gravimetric	N/A	Freeze
BC10	Rock Scrape	10-09-2006	889-25	E0603968	Solid - Wet Weight	Weight - Dry Material	2.91	grams		Combustion/Gravimetric	N/A	Freeze
BC10	Rock Scrape	10-09-2006	889-25	E0603968	Solid - Wet Weight	Ash-Free Dry Weight	1.25	grams	0.001	Combustion/Gravimetric	N/A	Freeze
BC09	Diatometer	08-16-2007	5053-76	E0702983	Solid - Wet Weight	Sample Analyzed	54.1	mL		Combustion/Gravimetric	N/A	Freeze
BC09	Diatometer	08-16-2007	5053-76	E0702983	Solid - Wet Weight	Weight - Dry Material	0.089	grams		Combustion/Gravimetric	N/A	Freeze
BC09	Diatometer	08-16-2007	5053-76	E0702983	Solid - Wet Weight	Ash-Free Dry Weight	0.018	grams	0.001	Combustion/Gravimetric	N/A	Freeze
BC10	Diatometer	08-16-2007	5053-77	E0702982	Solid - Wet Weight	Sample Analyzed	76.5	mL		Combustion/Gravimetric	N/A	Freeze
BC10	Diatometer	08-16-2007	5053-77	E0702982	Solid - Wet Weight	Weight - Dry Material	0.116	grams		Combustion/Gravimetric	N/A	Freeze
BC10	Diatometer	08-16-2007	5053-77	E0702982	Solid - Wet Weight	Ash-Free Dry Weight	0.019	grams	0.001	Combustion/Gravimetric	N/A	Freeze

Palmerton Periphyton 2006 Aquashicola Creek
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
AC01	Rock Scrape	10-11-2006	889-27	E0603970	Solid – Wet Weight	Sample Analyzed	148	mL		Combustion/Gravimetric	N/A	Freeze
AC01	Rock Scrape	10-11-2006	889-27	E0603970	Solid – Wet Weight	Weight – Dry Material	2.67	grams		Combustion/Gravimetric	N/A	Freeze
AC01	Rock Scrape	10-11-2006	889-27	E0603970	Solid – Wet Weight	Ash-Free Dry Weight	1.41	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC02/03	Rock Scrape	10-11-2006	889-28	E0603971	Solid – Wet Weight	Sample Analyzed	179	mL		Combustion/Gravimetric	N/A	Freeze
AC02/03	Rock Scrape	10-11-2006	889-28	E0603971	Solid – Wet Weight	Weight – Dry Material	3.9	grams		Combustion/Gravimetric	N/A	Freeze
AC02/03	Rock Scrape	10-11-2006	889-28	E0603971	Solid – Wet Weight	Ash-Free Dry Weight	1.85	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC04	Rock Scrape	10-10-2006	889-29	E0603972	Solid – Wet Weight	Sample Analyzed	100	mL		Combustion/Gravimetric	N/A	Freeze
AC04	Rock Scrape	10-10-2006	889-29	E0603972	Solid – Wet Weight	Weight – Dry Material	1.92	grams		Combustion/Gravimetric	N/A	Freeze
AC04	Rock Scrape	10-10-2006	889-29	E0603972	Solid – Wet Weight	Ash-Free Dry Weight	1.18	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC05	Rock Scrape	10-10-2006	889-30	E0603973	Solid – Wet Weight	Sample Analyzed	242	mL		Combustion/Gravimetric	N/A	Freeze
AC05	Rock Scrape	10-10-2006	889-30	E0603973	Solid – Wet Weight	Weight – Dry Material	3.13	grams		Combustion/Gravimetric	N/A	Freeze
AC05	Rock Scrape	10-10-2006	889-30	E0603973	Solid – Wet Weight	Ash-Free Dry Weight	1.63	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC06	Rock Scrape	10-10-2006	889-21	E0603964	Solid – Wet Weight	Sample Analyzed	189	mL		Combustion/Gravimetric	N/A	Freeze
AC06	Rock Scrape	10-10-2006	889-21	E0603964	Solid – Wet Weight	Weight – Dry Material	2.3	grams		Combustion/Gravimetric	N/A	Freeze
AC06	Rock Scrape	10-10-2006	889-21	E0603964	Solid – Wet Weight	Ash-Free Dry Weight	1.24	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC07	Rock Scrape	10-10-2006	889-22	E0603965	Solid – Wet Weight	Sample Analyzed	249	mL		Combustion/Gravimetric	N/A	Freeze
AC07	Rock Scrape	10-10-2006	889-22	E0603965	Solid – Wet Weight	Weight – Dry Material	3.24	grams		Combustion/Gravimetric	N/A	Freeze
AC07	Rock Scrape	10-10-2006	889-22	E0603965	Solid – Wet Weight	Ash-Free Dry Weight	1.74	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC08	Rock Scrape	10-09-2006	889-23	E0603966	Solid – Wet Weight	Sample Analyzed	395	mL		Combustion/Gravimetric	N/A	Freeze
AC08	Rock Scrape	10-09-2006	889-23	E0603966	Solid – Wet Weight	Weight – Dry Material	2.13	grams		Combustion/Gravimetric	N/A	Freeze
AC08	Rock Scrape	10-09-2006	889-23	E0603966	Solid – Wet Weight	Ash-Free Dry Weight	1.29	grams	0.001	Combustion/Gravimetric	N/A	Freeze

Palmerton Periphyton 2007 Aquashicola Creek
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
AC01	Diatometer	08-16-2007	5053-69	E0702975	Solid - Wet Weight	Sample Analyzed	78.2	mL		Combustion/Gravimetric	N/A	Freeze
AC01	Diatometer	08-16-2007	5053-69	E0702975	Solid - Wet Weight	Weight - Dry Material	0.093	grams		Combustion/Gravimetric	N/A	Freeze
AC01	Diatometer	08-16-2007	5053-69	E0702975	Solid - Wet Weight	Ash-Free Dry Weight	0.024	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC01	Rock Scrape	08-02-2007	5053-25	E0702799	Solid - Wet Weight	Sample Analyzed	47.6	mL		Combustion/Gravimetric	N/A	Freeze
AC01	Rock Scrape	08-02-2007	5053-25	E0702799	Solid - Wet Weight	Weight - Dry Material	0.447	grams		Combustion/Gravimetric	N/A	Freeze
AC01	Rock Scrape	08-02-2007	5053-25	E0702799	Solid - Wet Weight	Ash-Free Dry Weight	0.254	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC02/03	Diatometer	08-16-2007	5053-70	E0702976	Solid - Wet Weight	Sample Analyzed	80.1	mL		Combustion/Gravimetric	N/A	Freeze
AC02/03	Diatometer	08-16-2007	5053-70	E0702976	Solid - Wet Weight	Weight - Dry Material	0.094	grams		Combustion/Gravimetric	N/A	Freeze
AC02/03	Diatometer	08-16-2007	5053-70	E0702976	Solid - Wet Weight	Ash-Free Dry Weight	0.026	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC02/03	Rock Scrape	08-02-2007	5053-26	E0702800	Solid - Wet Weight	Sample Analyzed	48.1	mL		Combustion/Gravimetric	N/A	Freeze
AC02/03	Rock Scrape	08-02-2007	5053-26	E0702800	Solid - Wet Weight	Weight - Dry Material	0.301	grams		Combustion/Gravimetric	N/A	Freeze
AC02/03	Rock Scrape	08-02-2007	5053-26	E0702800	Solid - Wet Weight	Ash-Free Dry Weight	0.172	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC04	Diatometer	08-16-2007	5053-71	E0702977	Solid - Wet Weight	Sample Analyzed	75.8	mL		Combustion/Gravimetric	N/A	Freeze
AC04	Diatometer	08-16-2007	5053-71	E0702977	Solid - Wet Weight	Weight - Dry Material	0.075	grams		Combustion/Gravimetric	N/A	Freeze
AC04	Diatometer	08-16-2007	5053-71	E0702977	Solid - Wet Weight	Ash-Free Dry Weight	0.025	grams	0.001	Combustion/Gravimetric	N/A	Freeze

Palmerton Periphyton 2007 Aquashicola Creek
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
AC04	Rock Scrape	08-02-2007	5053-27	E0702801	Solid - Wet Weight	Sample Analyzed	49.5	mL		Combustion/Gravimetric	N/A	Freeze
AC04	Rock Scrape	08-02-2007	5053-27	E0702801	Solid - Wet Weight	Weight - Dry Material	0.66	grams		Combustion/Gravimetric	N/A	Freeze
AC04	Rock Scrape	08-02-2007	5053-27	E0702801	Solid - Wet Weight	Ash-Free Dry Weight	0.221	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC05	Diatometer	08-16-2007	5053-72	E0702978	Solid - Wet Weight	Sample Analyzed	78.2	mL		Combustion/Gravimetric	N/A	Freeze
AC05	Diatometer	08-16-2007	5053-72	E0702978	Solid - Wet Weight	Weight - Dry Material	0.051	grams		Combustion/Gravimetric	N/A	Freeze
AC05	Diatometer	08-16-2007	5053-72	E0702978	Solid - Wet Weight	Ash-Free Dry Weight	0.021	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC05	Rock Scrape	08-02-2007	5053-28	E0702802	Solid - Wet Weight	Sample Analyzed	49.4	mL		Combustion/Gravimetric	N/A	Freeze
AC05	Rock Scrape	08-02-2007	5053-28	E0702802	Solid - Wet Weight	Weight - Dry Material	0.138	grams		Combustion/Gravimetric	N/A	Freeze
AC05	Rock Scrape	08-02-2007	5053-28	E0702802	Solid - Wet Weight	Ash-Free Dry Weight	0.057	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC06	Diatometer	08-16-2007	5053-73	E0702979	Solid - Wet Weight	Sample Analyzed	78.8	mL		Combustion/Gravimetric	N/A	Freeze
AC06	Diatometer	08-16-2007	5053-73	E0702979	Solid - Wet Weight	Weight - Dry Material	0.178	grams		Combustion/Gravimetric	N/A	Freeze
AC06	Diatometer	08-16-2007	5053-73	E0702979	Solid - Wet Weight	Ash-Free Dry Weight	0.051	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC06	Rock Scrape	08-01-2007	5053-29	E0702803	Solid - Wet Weight	Sample Analyzed	49.9	mL		Combustion/Gravimetric	N/A	Freeze
AC06	Rock Scrape	08-01-2007	5053-29	E0702803	Solid - Wet Weight	Weight - Dry Material	0.117	grams		Combustion/Gravimetric	N/A	Freeze
AC06	Rock Scrape	08-01-2007	5053-29	E0702803	Solid - Wet Weight	Ash-Free Dry Weight	0.04	grams	0.001	Combustion/Gravimetric	N/A	Freeze

Palmerton Periphyton 2007 Aquashicola Creek
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
AC07	Diatometer	08-16-2007	5053-74	E0702980	Solid - Wet Weight	Sample Analyzed	78.1	mL		Combustion/Gravimetric	N/A	Freeze
AC07	Diatometer	08-16-2007	5053-74	E0702980	Solid - Wet Weight	Weight - Dry Material	0.103	grams		Combustion/Gravimetric	N/A	Freeze
AC07	Diatometer	08-16-2007	5053-74	E0702980	Solid - Wet Weight	Ash-Free Dry Weight	0.02	grams	0.001	Combustion/Gravimetric	N/A	Freeze
AC08	Diatometer	08-16-2007	5053-75	E0702981	Solid - Wet Weight	Sample Analyzed	77.7	mL		Combustion/Gravimetric	N/A	Freeze
AC08	Diatometer	08-16-2007	5053-75	E0702981	Solid - Wet Weight	Weight - Dry Material	0.135	grams		Combustion/Gravimetric	N/A	Freeze
AC08	Diatometer	08-16-2007	5053-75	E0702981	Solid - Wet Weight	Ash-Free Dry Weight	0.026	grams	0.001	Combustion/Gravimetric	N/A	Freeze

Palmerton Periphyton 2007 Lehigh River
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
LR00	Diatometer	08-16-2007	5053-78	E0702990	Solid - Wet Weight	Sample Analyzed	77.9	mL		Combustion/Gravimetric	N/A	Freeze
LR00	Diatometer	08-16-2007	5053-78	E0702990	Solid - Wet Weight	Weight - Dry Material	0.099	grams		Combustion/Gravimetric	N/A	Freeze
LR00	Diatometer	08-16-2007	5053-78	E0702990	Solid - Wet Weight	Ash-Free Dry Weight	0.034	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR00	Rock Scrape	08-01-2007	5053-30	E0702804	Solid - Wet Weight	Sample Analyzed	50.3	mL		Combustion/Gravimetric	N/A	Freeze
LR00	Rock Scrape	08-01-2007	5053-30	E0702804	Solid - Wet Weight	Weight - Dry Material	0.102	grams		Combustion/Gravimetric	N/A	Freeze
LR00	Rock Scrape	08-01-2007	5053-30	E0702804	Solid - Wet Weight	Ash-Free Dry Weight	0.047	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR01	Diatometer	08-16-2007	5053-79	E0702989	Solid - Wet Weight	Sample Analyzed	77.9	mL		Combustion/Gravimetric	N/A	Freeze
LR01	Diatometer	08-16-2007	5053-79	E0702989	Solid - Wet Weight	Weight - Dry Material	0.027	grams		Combustion/Gravimetric	N/A	Freeze
LR01	Diatometer	08-16-2007	5053-79	E0702989	Solid - Wet Weight	Ash-Free Dry Weight	0.016	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR01	Rock Scrape	08-01-2007	5053-31	E0702805	Solid - Wet Weight	Sample Analyzed	47.4	mL		Combustion/Gravimetric	N/A	Freeze

Palmerton Periphyton 2007 Lehigh River
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
LR01	Rock Scrape	08-01-2007	5053-31	E0702805	Solid - Wet Weight	Weight - Dry Material	0.181	grams		Combustion/Gravimetric	N/A	Freeze
LR01	Rock Scrape	08-01-2007	5053-31	E0702805	Solid - Wet Weight	Ash-Free Dry Weight	0.074	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR02	Diatometer	08-16-2007	5053-80	E0702988	Solid - Wet Weight	Sample Analyzed	95.9	mL		Combustion/Gravimetric	N/A	Freeze
LR02	Diatometer	08-16-2007	5053-80	E0702988	Solid - Wet Weight	Weight - Dry Material	0.035	grams		Combustion/Gravimetric	N/A	Freeze
LR02	Diatometer	08-16-2007	5053-80	E0702988	Solid - Wet Weight	Ash-Free Dry Weight	0.016	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR02	Rock Scrape	07-31-2007	5053-32	E0702806	Solid - Wet Weight	Sample Analyzed	45.3	mL		Combustion/Gravimetric	N/A	Freeze
LR02	Rock Scrape	07-31-2007	5053-32	E0702806	Solid - Wet Weight	Weight - Dry Material	0.083	grams		Combustion/Gravimetric	N/A	Freeze
LR02	Rock Scrape	07-31-2007	5053-32	E0702806	Solid - Wet Weight	Ash-Free Dry Weight	0.04	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR03	Diatometer	08-16-2007	5053-81	E0702987	Solid - Wet Weight	Sample Analyzed	76.6	mL		Combustion/Gravimetric	N/A	Freeze
LR03	Diatometer	08-16-2007	5053-81	E0702987	Solid - Wet Weight	Weight - Dry Material	0.136	grams		Combustion/Gravimetric	N/A	Freeze
LR03	Diatometer	08-16-2007	5053-81	E0702987	Solid - Wet Weight	Ash-Free Dry Weight	0.054	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR03	Rock Scrape	07-31-2007	5053-33	E0702807	Solid - Wet Weight	Sample Analyzed	47.6	mL		Combustion/Gravimetric	N/A	Freeze
LR03	Rock Scrape	07-31-2007	5053-33	E0702807	Solid - Wet Weight	Weight - Dry Material	0.442	grams		Combustion/Gravimetric	N/A	Freeze
LR03	Rock Scrape	07-31-2007	5053-33	E0702807	Solid - Wet Weight	Ash-Free Dry Weight	0.215	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR03.5	Diatometer	08-16-2007	5053-82	E0702986	Solid - Wet Weight	Sample Analyzed	82.4	mL		Combustion/Gravimetric	N/A	Freeze
LR03.5	Diatometer	08-16-2007	5053-82	E0702986	Solid - Wet Weight	Weight - Dry Material	0.012	grams		Combustion/Gravimetric	N/A	Freeze
LR03.5	Diatometer	08-16-2007	5053-82	E0702986	Solid - Wet Weight	Ash-Free Dry Weight	0.007	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR03.5	Rock Scrape	07-31-2007	5053-34	E0702808	Solid - Wet Weight	Sample Analyzed	47.9	mL		Combustion/Gravimetric	N/A	Freeze
LR03.5	Rock Scrape	07-31-2007	5053-34	E0702808	Solid - Wet Weight	Weight - Dry Material	0.063	grams		Combustion/Gravimetric	N/A	Freeze
LR03.5	Rock Scrape	07-31-2007	5053-34	E0702808	Solid - Wet Weight	Ash-Free Dry Weight	0.037	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR04	Diatometer	08-16-2007	5053-83	E0702985	Solid - Wet Weight	Sample Analyzed	79.8	mL		Combustion/Gravimetric	N/A	Freeze
LR04	Diatometer	08-16-2007	5053-83	E0702985	Solid - Wet Weight	Weight - Dry Material	0.021	grams		Combustion/Gravimetric	N/A	Freeze
LR04	Diatometer	08-16-	5053-83	E0702985	Solid - Wet	Ash-Free Dry	0.01	grams	0.001	Combustion/Gravimetric	N/A	Freeze

Palmerton Periphyton 2007 Lehigh River
Ash-Free Dry Weight Analysis

Site ID	Device	Collection Date	EcoAnalysts Sample ID	UIASL Sample ID	Matrix	Analyte	Report Result	Units	Detect Limit	Analysis Method	Prep Method	Preservative
LR04	Rock Scrape	2007 07-30-2007	5053-35	E0702809	Weight Solid - Wet Weight	Weight Sample Analyzed	50.1	mL		Combustion/Gravimetric	N/A	Freeze
LR04	Rock Scrape	07-30-2007	5053-35	E0702809	Solid - Wet Weight	Weight - Dry Material	0.178	grams		Combustion/Gravimetric	N/A	Freeze
LR04	Rock Scrape	07-30-2007	5053-35	E0702809	Solid - Wet Weight	Ash-Free Dry Weight	0.065	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR05	Diatometer	08-16-2007	5053-84	E0702984	Solid - Wet Weight	Sample Analyzed	76.8	mL		Combustion/Gravimetric	N/A	Freeze
LR05	Diatometer	08-16-2007	5053-84	E0702984	Solid - Wet Weight	Weight - Dry Material	0.139	grams		Combustion/Gravimetric	N/A	Freeze
LR05	Diatometer	08-16-2007	5053-84	E0702984	Solid - Wet Weight	Ash-Free Dry Weight	0.051	grams	0.001	Combustion/Gravimetric	N/A	Freeze
LR05	Rock Scrape	07-30-2007	5053-36	E0702810	Solid - Wet Weight	Sample Analyzed	48.1	mL		Combustion/Gravimetric	N/A	Freeze
LR05	Rock Scrape	07-30-2007	5053-36	E0702810	Solid - Wet Weight	Weight - Dry Material	0.122	grams		Combustion/Gravimetric	N/A	Freeze
LR05	Rock Scrape	07-30-2007	5053-36	E0702810	Solid - Wet Weight	Ash-Free Dry Weight	0.052	grams	0.001	Combustion/Gravimetric	N/A	Freeze