

## **APPENDIX A-3:**

### **Benthic Macroinvertebrate Field and Laboratory Data Sheets**

- Form 1: Benthic Macroinvertebrate Field Data Sheet
- Form 2: Benthic Macroinvertebrate Sample Log-In Sheet
- Form 3: Benthic Macroinvertebrate Laboratory Bench Sheet
- Form 4: Preliminary Assessment Score Sheet (Pass)

## BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

|                                 |                                |                   |
|---------------------------------|--------------------------------|-------------------|
| STREAM NAME                     | LOCATION                       |                   |
| STATION # _____ RIVERMILE _____ | STREAM CLASS                   |                   |
| LAT _____ LONG _____            | RIVER BASIN                    |                   |
| STORET #                        | AGENCY                         |                   |
| INVESTIGATORS                   | LOT NUMBER                     |                   |
| FORM COMPLETED BY               | DATE _____<br>TIME _____ AM PM | REASON FOR SURVEY |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>HABITAT TYPES</b>     | <b>Indicate the percentage of each habitat type present</b><br><input type="checkbox"/> Cobble _____% <input type="checkbox"/> Snags _____% <input type="checkbox"/> Vegetated Banks _____% <input type="checkbox"/> Sand _____%<br><input type="checkbox"/> Submerged Macrophytes _____% <input type="checkbox"/> Other ( _____ ) _____%                                                                                                                                                                                                                                                                                        |
| <b>SAMPLE COLLECTION</b> | <b>Gear used</b> <input type="checkbox"/> D-frame <input type="checkbox"/> kick-net <input type="checkbox"/> Other _____<br><br><b>How were the samples collected?</b> <input type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat<br><br><b>Indicate the number of jabs/kicks taken in each habitat type.</b><br><input type="checkbox"/> Cobble _____ <input type="checkbox"/> Snags _____ <input type="checkbox"/> Vegetated Banks _____ <input type="checkbox"/> Sand _____<br><input type="checkbox"/> Submerged Macrophytes _____ <input type="checkbox"/> Other ( _____ ) _____ |
| <b>GENERAL COMMENTS</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

### QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

|                   |   |   |   |   |   |                    |   |   |   |   |   |
|-------------------|---|---|---|---|---|--------------------|---|---|---|---|---|
| Periphyton        | 0 | 1 | 2 | 3 | 4 | Slimes             | 0 | 1 | 2 | 3 | 4 |
| Filamentous Algae | 0 | 1 | 2 | 3 | 4 | Macroinvertebrates | 0 | 1 | 2 | 3 | 4 |
| Macrophytes       | 0 | 1 | 2 | 3 | 4 | Fish               | 0 | 1 | 2 | 3 | 4 |

### FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

|                 |   |   |   |   |   |             |   |   |   |   |   |               |   |   |   |   |   |
|-----------------|---|---|---|---|---|-------------|---|---|---|---|---|---------------|---|---|---|---|---|
| Porifera        | 0 | 1 | 2 | 3 | 4 | Anisoptera  | 0 | 1 | 2 | 3 | 4 | Chironomidae  | 0 | 1 | 2 | 3 | 4 |
| Hydrozoa        | 0 | 1 | 2 | 3 | 4 | Zygoptera   | 0 | 1 | 2 | 3 | 4 | Ephemeroptera | 0 | 1 | 2 | 3 | 4 |
| Platyhelminthes | 0 | 1 | 2 | 3 | 4 | Hemiptera   | 0 | 1 | 2 | 3 | 4 | Trichoptera   | 0 | 1 | 2 | 3 | 4 |
| Turbellaria     | 0 | 1 | 2 | 3 | 4 | Coleoptera  | 0 | 1 | 2 | 3 | 4 | Other         | 0 | 1 | 2 | 3 | 4 |
| Hirudinea       | 0 | 1 | 2 | 3 | 4 | Lepidoptera | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |
| Oligochaeta     | 0 | 1 | 2 | 3 | 4 | Sialidae    | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |
| Isopoda         | 0 | 1 | 2 | 3 | 4 | Corydalidae | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |
| Amphipoda       | 0 | 1 | 2 | 3 | 4 | Tipulidae   | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |
| Decapoda        | 0 | 1 | 2 | 3 | 4 | Empididae   | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |
| Gastropoda      | 0 | 1 | 2 | 3 | 4 | Simuliidae  | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |
| Bivalvia        | 0 | 1 | 2 | 3 | 4 | Tabinidae   | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |
|                 |   |   |   |   |   | Culcidae    | 0 | 1 | 2 | 3 | 4 |               |   |   |   |   |   |

# BENTHIC MACROINVERTEBRATE SAMPLE LOG-IN SHEET

[illegible]

Serial Code Example: B0754001(1)  
B = Benthos (F = Fish; P = Periphyton)# 0754 = project number # 001 = sample number # (1) = lot number (e.g., winter 1996 =1; summer 1996 = 2)

# BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

page \_\_\_\_ of \_\_\_\_

|                 |                 |                                                                                                                                             |  |
|-----------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------|--|
| STREAM NAME     |                 | LOCATION                                                                                                                                    |  |
| STATION # _____ | RIVERMILE _____ | STREAM CLASS                                                                                                                                |  |
| LAT _____       | LONG _____      | RIVER BASIN                                                                                                                                 |  |
| STORET #        |                 | AGENCY                                                                                                                                      |  |
| COLLECTED BY    | DATE _____      | LOT #                                                                                                                                       |  |
| TAXONOMIST      | DATE _____      | SUBSAMPLE TARGET <input type="checkbox"/> 100 <input type="checkbox"/> 200 <input type="checkbox"/> 300 <input type="checkbox"/> Other ____ |  |

Enter Family and/or Genus and Species name on blank line.

| Organisms     |  | No. | LS | TI | TCR | Organisms   |  | No. | LS | TI | TCR |
|---------------|--|-----|----|----|-----|-------------|--|-----|----|----|-----|
| Oligochaeta   |  |     |    |    |     | Megaloptera |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Hirudinea     |  |     |    |    |     | Coleoptera  |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Isopoda       |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Amphipoda     |  |     |    |    |     | Diptera     |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Decapoda      |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Ephemeroptera |  |     |    |    |     | Gastropoda  |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Plecoptera    |  |     |    |    |     | Pelecypoda  |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     | Other       |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Trichoptera   |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
| Hemiptera     |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |
|               |  |     |    |    |     |             |  |     |    |    |     |

Taxonomic certainty rating (TCR) 1-5:1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms \_\_\_\_\_

Total No. Taxa \_\_\_\_\_

## BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (BACK)

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SUBSAMPLING/SORTING INFORMATION</b><br><br>Sorter _____<br><br>Date _____ | Number of grids picked: _____<br><br>Time expenditure _____ No. of organisms _____<br><br>Indicate the presence of large or obviously abundant organisms:<br><br><hr style="border: 1px solid black;"/> <p>QC:      <input type="checkbox"/> YES      <input type="checkbox"/> NO      QC Checker _____</p><br><div style="text-align: center;"> <math display="block">  \begin{array}{c}  \text{\# organisms} \\  \text{originally sorted}  \end{array}  \div  \left(  \begin{array}{c}  \text{\# organisms} \\  \text{recovered by} \\  \text{checker}  \end{array}  +  \begin{array}{c}  \text{\# organisms} \\  \text{originally sorted}  \end{array}  \right)  =  \begin{array}{c}  \% \text{ sorting} \\  \text{efficiency}  \end{array}  </math> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 60px; height: 25px; display: flex; align-items: center; justify-content: center;"> </div> <div style="font-size: 2em;">÷</div> <div style="border: 1px solid black; width: 60px; height: 25px; display: flex; align-items: center; justify-content: center;"> </div> <div style="font-size: 2em;">+</div> <div style="border: 1px solid black; width: 60px; height: 25px; display: flex; align-items: center; justify-content: center;"> </div> <div style="font-size: 2em;">)</div> <div style="font-size: 2em;">=</div> <div style="border: 1px solid black; width: 60px; height: 25px; display: flex; align-items: center; justify-content: center;"> </div> </div> </div> <p>≥90%, sample passes _____</p> <p>&lt;90%, sample fails, action taken _____</p> <hr style="border: 1px solid black;"/> |
| <b>TAXONOMY</b><br><br>ID _____<br><br>Date _____                            | Explain TCR ratings of 3-5:<br><br><br>Other Comments (e.g. condition of specimens):<br><br><br><hr style="border: 1px solid black;"/> <p>QC:      <input type="checkbox"/> YES      <input type="checkbox"/> NO      QC Checker _____</p><br><div style="display: flex; justify-content: space-between;"> <div>Organism recognition</div> <div><input type="checkbox"/> pass</div> <div><input type="checkbox"/> fail</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Verification complete</div> <div><input type="checkbox"/> YES</div> <div><input type="checkbox"/> NO</div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

# PRELIMINARY ASSESSMENT SCORE SHEET (PASS)

page \_\_\_\_\_ of \_\_\_\_\_

|                                                                                                                                                 |                 |              |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|------------------------|
| STREAM NAME                                                                                                                                     |                 | LOCATION     |                        |
| STATION # _____                                                                                                                                 | RIVERMILE _____ | STREAM CLASS |                        |
| LAT _____                                                                                                                                       | LONG _____      | RIVER BASIN  |                        |
| STORET #                                                                                                                                        |                 | AGENCY       |                        |
| COLLECTED BY _____                                                                                                                              | DATE _____      | LOT # _____  | NUMBER OF SWEEPS _____ |
| HABITATS: <input type="checkbox"/> COBBLE <input type="checkbox"/> SHOREZONE <input type="checkbox"/> SNAGS <input type="checkbox"/> VEGETATION |                 |              |                        |

Enter Family and/or Genus and Species name on blank line.

| Organisms     |  | No. | LS | TI | TCR | Organisms                                                                                                                                                                                              |  | No. | LS | TI | TCR |
|---------------|--|-----|----|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|----|-----|
| Oligochaeta   |  |     |    |    |     | Megaloptera                                                                                                                                                                                            |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Hirudinea     |  |     |    |    |     | Coleoptera                                                                                                                                                                                             |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Isopoda       |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Amphipoda     |  |     |    |    |     | Diptera                                                                                                                                                                                                |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Decapoda      |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Ephemeroptera |  |     |    |    |     | Gastropoda                                                                                                                                                                                             |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Plecoptera    |  |     |    |    |     | Pelecypoda                                                                                                                                                                                             |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Trichoptera   |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |
| Hemiptera     |  |     |    |    |     | Taxonomic certainty rating (TCR) 1-5:1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials |  |     |    |    |     |
|               |  |     |    |    |     |                                                                                                                                                                                                        |  |     |    |    |     |

|                 | Site Value | Target Threshold | If 2 or more metrics are ≥ target threshold, site is<br><b>HEALTHY</b>               |
|-----------------|------------|------------------|--------------------------------------------------------------------------------------|
| Total No. Taxa  |            |                  |                                                                                      |
| EPT Taxa        |            |                  | If less than 2 metrics are within target range, site is<br><b>SUSPECTED IMPAIRED</b> |
| Tolerance Index |            |                  |                                                                                      |