

**Stream & Location:** Brandywine Creek (DS of former Hudson WWTP) RM: 1.85 Date: 7/30/17  
 Meany/Milneson

**River Code:** - - - **STORET #:** - - - **Lat./ Long.:** 41.2560 181.4750 **Office verified location**

**1) SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

|   |   |  |   |  |   |
|---|---|--|---|--|---|
| <p><b>BEST TYPES</b></p> <input type="checkbox"/> BLDR/SLABS [10]<br><input type="checkbox"/> BOULDER [9]<br><input type="checkbox"/> COBBLE [8]<br><input type="checkbox"/> GRAVEL [7]<br><input checked="" type="checkbox"/> SAND [6]<br><input type="checkbox"/> BEDROCK [5] | <p><b>POOL RIFFLE</b></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> | <p><b>OTHER TYPES</b></p> <input type="checkbox"/> HARDPAN [4]<br><input type="checkbox"/> DETRITUS [3]<br><input type="checkbox"/> MUCK [2]<br><input type="checkbox"/> SILT [2]<br><input type="checkbox"/> ARTIFICIAL [0] | <p><b>POOL RIFFLE</b></p> <p>X X</p> <p>_____</p> <p>_____</p> <p>X X</p> | <p><b>ORIGIN</b></p> <input type="checkbox"/> LIMESTONE [1]<br><input checked="" type="checkbox"/> TILLS [1]<br><input type="checkbox"/> WETLANDS [0]<br><input type="checkbox"/> HARDPAN [0]<br><input type="checkbox"/> SANDSTONE [0]<br><input type="checkbox"/> RIP/RAP [0]<br><input type="checkbox"/> LACUSTURINE [0]<br><input type="checkbox"/> SHALE [-1]<br><input type="checkbox"/> COAL FINES [-2] | <p><b>QUALITY</b></p> <input type="checkbox"/> HEAVY [-2]<br><input type="checkbox"/> MODERATE [-1]<br><input checked="" type="checkbox"/> NORMAL [0]<br><input type="checkbox"/> FREE [1]<br><input type="checkbox"/> EXTENSIVE [-2]<br><input type="checkbox"/> MODERATE [-1]<br><input type="checkbox"/> NORMAL [0]<br><input type="checkbox"/> NONE [1] |
|---|---|--|---|--|---|

**NUMBER OF BEST TYPES:**  4 or more [2]  3 or less [0]

**Comments**

**2) INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

|   |   |   |  |
|---|---|---|--|
| <p><b>UNDERCUT BANKS</b> [1]<br/> <b>OVERHANGING VEGETATION</b> [1]<br/> <b>SHALLOWS (IN SLOW WATER)</b> [1]<br/> <b>ROOTMATS</b> [1]</p> | <p><b>POOLS &gt; 70cm</b> [2]<br/> <b>ROOTWADS</b> [1]<br/> <b>BOULDERS</b> [1]</p> | <p><b>OXBOWS, BACKWATERS</b> [1]<br/> <b>AQUATIC MACROPHYTES</b> [1]<br/> <b>LOGS OR WOODY DEBRIS</b> [1]</p> | <p><b>AMOUNT</b><br/> <input type="checkbox"/> EXTENSIVE &gt;75% [11]<br/> <input checked="" type="checkbox"/> MODERATE 25-75% [7]<br/> <input type="checkbox"/> SPARSE 5-&lt;25% [3]<br/> <input type="checkbox"/> NEARLY ABSENT &lt;5% [1]</p> |
|---|---|---|--|

**Comments**

**3) CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

|  |  |  |   |
|--|--|--|---|
| <p><b>SINUOSITY</b></p> <input type="checkbox"/> HIGH [4]<br><input type="checkbox"/> MODERATE [3]<br><input checked="" type="checkbox"/> LOW [2]<br><input type="checkbox"/> NONE [1] | <p><b>DEVELOPMENT</b></p> <input type="checkbox"/> EXCELLENT [7]<br><input type="checkbox"/> GOOD [5]<br><input type="checkbox"/> FAIR [3]<br><input checked="" type="checkbox"/> POOR [1] | <p><b>CHANNELIZATION</b></p> <input checked="" type="checkbox"/> NONE [6]<br><input type="checkbox"/> RECOVERED [4]<br><input type="checkbox"/> RECOVERING [3]<br><input type="checkbox"/> RECENT OR NO RECOVERY [1] | <p><b>STABILITY</b></p> <input type="checkbox"/> HIGH [3]<br><input checked="" type="checkbox"/> MODERATE [2]<br><input type="checkbox"/> LOW [1] |
|--|--|--|---|

**Comments**

**4) BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

|   |  |   |  |
|---|--|---|--|
| <p><b>EROSION</b></p> <input checked="" type="checkbox"/> NONE / LITTLE [3]<br><input type="checkbox"/> MODERATE [2]<br><input type="checkbox"/> HEAVY / SEVERE [1] | <p><b>RIPARIAN WIDTH</b></p> <input type="checkbox"/> WIDE > 50m [4]<br><input checked="" type="checkbox"/> MODERATE 10-50m [3]<br><input type="checkbox"/> NARROW 5-10m [2]<br><input type="checkbox"/> VERY NARROW < 5m [1]<br><input type="checkbox"/> NONE [0] | <p><b>FLOOD PLAIN QUALITY</b></p> <input checked="" type="checkbox"/> FOREST, SWAMP [3]<br><input checked="" type="checkbox"/> SHRUB OR OLD FIELD [2]<br><input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]<br><input type="checkbox"/> FENCED PASTURE [1]<br><input type="checkbox"/> OPEN PASTURE, ROWCROP [0] | <p><b>CONSERVATION TILLAGE</b> [1]<br/> <input type="checkbox"/> URBAN OR INDUSTRIAL [0]<br/> <input type="checkbox"/> MINING / CONSTRUCTION [0]</p> |
|---|--|---|--|

**Comments**

**5) POOL / GLIDE AND RIFFLE / RUN QUALITY**

|  |   |  |   |
|--|---|--|---|
| <p><b>MAXIMUM DEPTH</b><br/>                 Check ONE (ONLY!)</p> <input checked="" type="checkbox"/> > 1m [6]<br><input type="checkbox"/> 0.7-<1m [4]<br><input type="checkbox"/> 0.4-<0.7m [2]<br><input type="checkbox"/> 0.2-<0.4m [1]<br><input type="checkbox"/> < 0.2m [0] | <p><b>CHANNEL WIDTH</b><br/>                 Check ONE (Or 2 &amp; average)</p> <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]<br><input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]<br><input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0] | <p><b>CURRENT VELOCITY</b><br/>                 Check ALL that apply</p> <input type="checkbox"/> TORRENTIAL [-1]<br><input type="checkbox"/> VERY FAST [1]<br><input type="checkbox"/> FAST [1]<br><input checked="" type="checkbox"/> MODERATE [1] | <p><input type="checkbox"/> SLOW [1]<br/> <input type="checkbox"/> INTERSTITIAL [-1]<br/> <input type="checkbox"/> INTERMITTENT [-2]<br/> <input type="checkbox"/> EDDIES [1]</p> |
|--|---|--|---|

**Comments**

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average).  NO RIFFLE [metric=0]

|  |   |  |  |
|--|---|--|--|
| <p><b>RIFFLE DEPTH</b></p> <input type="checkbox"/> BEST AREAS > 10cm [2]<br><input type="checkbox"/> BEST AREAS 5-10cm [1]<br><input checked="" type="checkbox"/> BEST AREAS < 5cm [metric=0] | <p><b>RUN DEPTH</b></p> <input type="checkbox"/> MAXIMUM > 50cm [2]<br><input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <p><b>RIFFLE / RUN SUBSTRATE</b></p> <input checked="" type="checkbox"/> STABLE (e.g., Gobble, Boulder) [2]<br><input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]<br><input checked="" type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <p><b>RIFFLE / RUN EMBEDDEDNESS</b></p> <input type="checkbox"/> NONE [2]<br><input type="checkbox"/> LOW [1]<br><input checked="" type="checkbox"/> MODERATE [0]<br><input type="checkbox"/> EXTENSIVE [-1] |
|--|---|--|--|

**Comments**

**6) GRADIENT** (6.25 ft/ml)  VERY LOW - LOW [2-4]  MODERATE [6-10]  HIGH - VERY HIGH [10-6]

**DRAINAGE AREA** (5.82 mi<sup>2</sup>)

**% POOL:**  **% GLIDE:**   
**% RUN:**  **% RIFFLE:**

**Comments**

**AJ SAMPLED REACH**  
Check ALL that apply

Comment RE: Reach consistency/Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

**METHOD**

- BOAT
  - WADE
  - L. LINE
  - OTHER
- 1st sample pass-- 2nd
- HIGH
  - UP
  - NORMAL
  - LOW
  - DRY

**DISTANCE**

- 0.5 Km
- 0.2 Km
- 0.15 Km
- 0.12 Km
- OTHER

**CLARITY**

- < 20 cm
- 20-40 cm
- 40-70 cm
- > 70 cm/ CTB
- SECCHI DEPTH

**CANOPY**

- > 85%-- OPEN
- 55%--<85%
- 30%--<55%
- 10%--<30%
- <10%-- CLOSED

**CJ RECREATION**

- AREA
- DEPTH
- POOL:  >100ft<sup>2</sup>  >3ft

**BJ AESTHETICS**

- NUISANCE ALGAE
- INVASIVE MACROPHYTES
- EXCESS TURBIDITY
- DISCOLORATION
- FOAM / SCUM
- OIL SHEEN
- TRASH / LITTER
- NUISANCE ODOR
- SLUDGE DEPOSITS
- CSOs/SSOs/OUTFALLS

**DJ MAINTENANCE**

- PUBLIC / PRIVATE / BOTH / NA
- ACTIVE / HISTORIC / BOTH / NA
- YOUNG-SUCCESSION-OLD
- SPRAY / SNAG / REMOVED
- MODIFIED / DIPPED OUT / NA
- LEVEED / ONE SIDED
- RELOCATED / CUTOFFS
- MOVING-BEDLOAD-STABLE
- ARMOURD / SLUMPS
- ISLANDS / SCOURED
- IMPOUNDED / DESICCATED
- FLOOD CONTROL / DRAINAGE

**EJ ISSUES**

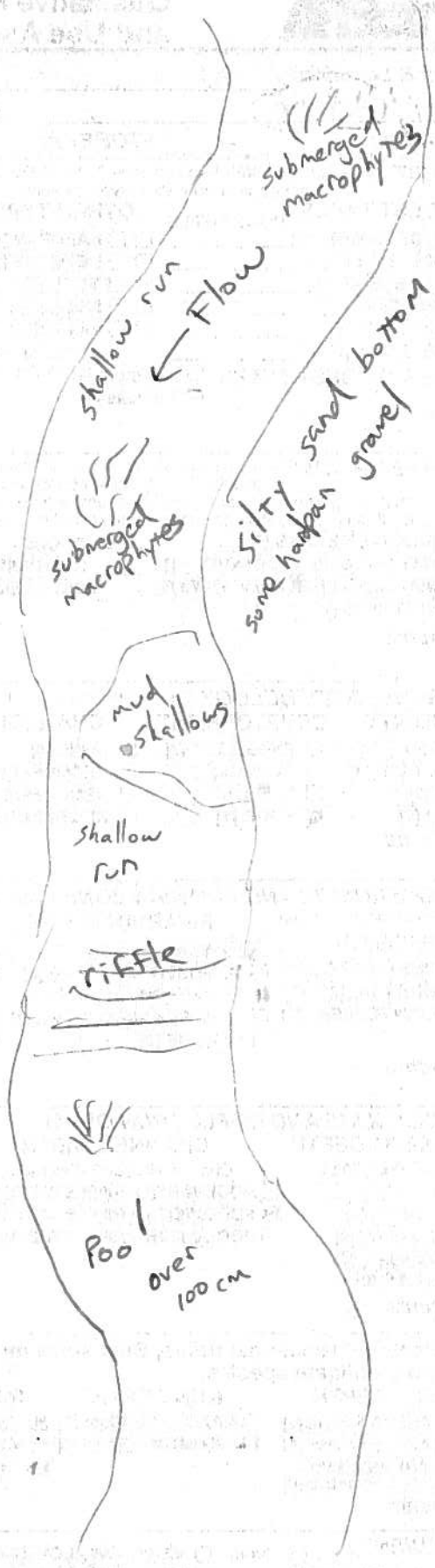
- WWTP / CSO / NPDES / INDUSTRY
- HARDENED / URBAN / DIRT&GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK / EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND / STAGNANT
- PARK / GOLF / LAWN / HOME
- ATMOSPHERE / DATA PAUCITY

**FJ MEASUREMENTS**

- $\bar{x}$  width
- $\bar{x}$  depth
- max. depth
- $\bar{x}$  bankfull width
- bankfull  $\bar{x}$  depth
- W/D ratio
- bankfull max. depth
- floodprone  $\bar{x}^2$  width
- entrench. ratio

Legacy Tree:

**Stream Drawing:**



**Stream & Location:** Brandywine creek (upstream of E. Highland Rd) **RM:** 3.55 **Date:** 7/27/17

Friedman, Mark **Scorer's Full Name & Affiliation:** Northeast Ohio Regional Sewer District

**River Code:** - **STORET #:** - **Lat./ Long.:** 41.2936 181.5241 (NAD 83 - decimal °) **Office verified location**

**1) SUBSTRATE** Check **ONLY** Two substrate **TYPE BOXES**; estimate % or note every type present

|   |  |  |   |   |  |
|---|--|--|---|---|--|
| <p><b>BEST TYPES</b></p> <input type="checkbox"/> BLDR/SLABS [10]<br><input type="checkbox"/> BOULDER [9]<br><input type="checkbox"/> COBBLE [8]<br><input type="checkbox"/> GRAVEL [7]<br><input type="checkbox"/> SAND [6]<br><input checked="" type="checkbox"/> BEDROCK [5] | <p><b>POOL RIFFLE</b></p><br><br><br><br><br><br><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <p><b>OTHER TYPES</b></p> <input type="checkbox"/> HARDPAN [4]<br><input type="checkbox"/> DETRITUS [3]<br><input type="checkbox"/> MUCK [2]<br><input type="checkbox"/> SILT [2]<br><input type="checkbox"/> ARTIFICIAL [0] | <p><b>POOL RIFFLE</b></p><br><br><br><br><br><br><br><br><br><br><br><br> | <p><b>ORIGIN</b></p> <input type="checkbox"/> LIMESTONE [1]<br><input type="checkbox"/> TILLS [1]<br><input type="checkbox"/> WETLANDS [0]<br><input type="checkbox"/> HARDPAN [0]<br><input type="checkbox"/> SANDSTONE [0]<br><input type="checkbox"/> RIP/RAP [0]<br><input type="checkbox"/> LACUSTURINE [0]<br><input type="checkbox"/> SHALE [-1]<br><input type="checkbox"/> COAL FINES [-2] | <p><b>QUALITY</b></p> <input type="checkbox"/> HEAVY [-2]<br><input type="checkbox"/> MODERATE [-1]<br><input type="checkbox"/> NORMAL [0]<br><input checked="" type="checkbox"/> FREE [1]<br><input type="checkbox"/> EXTENSIVE [-2]<br><input type="checkbox"/> MODERATE [-1]<br><input type="checkbox"/> NORMAL [0]<br><input checked="" type="checkbox"/> NONE [1] |
|---|--|--|---|---|--|

**NUMBER OF BEST TYPES:**  4 or more [2]  3 or less [0]

**Comments**

**2) INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

|  |   |   |
|--|---|---|
| <p><input checked="" type="checkbox"/> UNDERCUT BANKS [1]<br/> <input type="checkbox"/> OVERHANGING VEGETATION [1]<br/> <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]<br/> <input type="checkbox"/> ROOTMATS [1]</p> | <p><input type="checkbox"/> POOLS &gt; 70cm [2]<br/> <input type="checkbox"/> ROOTWADS [1]<br/> <input type="checkbox"/> BOULDERS [1]</p> | <p><input type="checkbox"/> OXBOWS, BACKWATERS [1]<br/> <input type="checkbox"/> AQUATIC MACROPHYTES [1]<br/> <input type="checkbox"/> LOGS OR WOODY DEBRIS [1]</p> |
|--|---|---|

**AMOUNT** Check ONE (Or 2 & average)  
 EXTENSIVE >75% [1]  
 MODERATE 25-75% [7]  
 SPARSE 5-<25% [3]  
 NEARLY ABSENT <5% [1]

**Comments**

**3) CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

|  |  |  |   |
|--|--|--|---|
| <p><b>SINUOSITY</b></p> <input type="checkbox"/> HIGH [4]<br><input checked="" type="checkbox"/> MODERATE [3]<br><input type="checkbox"/> LOW [2]<br><input type="checkbox"/> NONE [1] | <p><b>DEVELOPMENT</b></p> <input type="checkbox"/> EXCELLENT [7]<br><input checked="" type="checkbox"/> GOOD [5]<br><input type="checkbox"/> FAIR [3]<br><input type="checkbox"/> POOR [1] | <p><b>CHANNELIZATION</b></p> <input checked="" type="checkbox"/> NONE [6]<br><input type="checkbox"/> RECOVERED [4]<br><input type="checkbox"/> RECOVERING [3]<br><input type="checkbox"/> RECENT OR NO RECOVERY [1] | <p><b>STABILITY</b></p> <input checked="" type="checkbox"/> HIGH [3]<br><input type="checkbox"/> MODERATE [2]<br><input type="checkbox"/> LOW [1] |
|--|--|--|---|

**Comments**

**4) BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

|  |  |  |
|--|--|--|
| <p><b>EROSION</b></p> <input checked="" type="checkbox"/> NONE / LITTLE [3]<br><input checked="" type="checkbox"/> MODERATE [2]<br><input type="checkbox"/> HEAVY / SEVERE [1] | <p><b>RIPARIAN WIDTH</b></p> <input type="checkbox"/> WIDE > 50m [4]<br><input checked="" type="checkbox"/> MODERATE 10-50m [3]<br><input type="checkbox"/> NARROW 5-10m [2]<br><input type="checkbox"/> VERY NARROW < 5m [1]<br><input type="checkbox"/> NONE [0] | <p><b>FLOOD PLAIN QUALITY</b></p> <input type="checkbox"/> FOREST, SWAMP [3]<br><input type="checkbox"/> SHRUB OR OLD FIELD [2]<br><input checked="" type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]<br><input type="checkbox"/> FENCED PASTURE [1]<br><input type="checkbox"/> OPEN PASTURE, ROWCROP [0] |
|--|--|--|

**Comments** Bedrock is heavily eroded w/ little to no "dirt" erosion

**5) POOL / GLIDE AND RIFFLE / RUN QUALITY**

|   |  |   |
|---|--|---|
| <p><b>MAXIMUM DEPTH</b> Check ONE (ONLY!)</p> <input checked="" type="checkbox"/> > 1m [6]<br><input type="checkbox"/> 0.7-<1m [4]<br><input type="checkbox"/> 0.4-<0.7m [2]<br><input type="checkbox"/> 0.2-<0.4m [1]<br><input type="checkbox"/> < 0.2m [0] | <p><b>CHANNEL WIDTH</b> Check ONE (Or 2 &amp; average)</p> <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]<br><input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]<br><input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0] | <p><b>CURRENT VELOCITY</b> Check ALL that apply</p> <input type="checkbox"/> TORRENTIAL [-1]<br><input type="checkbox"/> VERY FAST [1]<br><input type="checkbox"/> FAST [1]<br><input checked="" type="checkbox"/> MODERATE [1]<br><input type="checkbox"/> SLOW [1]<br><input type="checkbox"/> INTERSTITIAL [-1]<br><input type="checkbox"/> INTERMITTENT [-2]<br><input type="checkbox"/> EDDIES [1] |
|---|--|---|

**Comments**

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

|  |   |   |
|--|---|---|
| <p><b>RIFFLE DEPTH</b></p> <input checked="" type="checkbox"/> BEST AREAS > 10cm [2]<br><input type="checkbox"/> BEST AREAS 5-10cm [1]<br><input type="checkbox"/> BEST AREAS < 5cm [metric=0] | <p><b>RUN DEPTH</b> Check ONE (Or 2 &amp; average).</p> <input type="checkbox"/> MAXIMUM > 50cm [2]<br><input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <p><b>RIFFLE / RUN SUBSTRATE</b></p> <input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]<br><input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]<br><input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] |
|--|---|---|

**Comments**

**6) GRADIENT** (120 ft/ml)

|   |   |  |
|---|---|--|
| <p><b>DRAINAGE AREA</b> (22.9 mi<sup>2</sup>)</p> <input type="checkbox"/> VERY LOW - LOW [2-4]<br><input type="checkbox"/> MODERATE [6-10]<br><input type="checkbox"/> HIGH - VERY HIGH [10-6] | <p>% POOL: <input type="text"/> % GLIDE: <input type="text"/><br/>         % RUN: <input type="text"/> % RIFFLE: <input type="text"/></p> | <p><b>Gradient Maximum</b> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">4</span></p> |
|---|---|--|

*→ very high = 4\**

Comment RE: Reach consistency/Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

**AJ SAMPLED REACH**

Check ALL that apply

**METHOD**

- BOAT
- WADE
- L. LINE
- OTHER

**STAGE**

- 1st -sample pass-- 2nd
- HIGH
  - UP
  - NORMAL
  - LOW
  - DRY

**DISTANCE**

- 0.5 Km
- 0.2 Km
- 0.15 Km
- 0.12 Km
- OTHER

**CLARITY**

- < 20 cm
- 20-40 cm
- 40-70 cm
- > 70 cm/ CTB
- SECCHI DEPTH

meters

**CANOPY**

- > 85%- OPEN
- 55%-<85%
- 30%-<55%
- 10%-<30%
- <10%- CLOSED

1st \_\_\_\_\_ cm  
2nd \_\_\_\_\_ cm

**BJ AESTHETICS**

- NUISANCE ALGAE
- INVASIVE MACROPHYTES
- EXCESS TURBIDITY
- DISCOLORATION
- FOAM / SCUM
- OIL SHEEN
- TRASH / LITTER
- NUISANCE ODOR
- SLUDGE DEPOSITS
- CSOs/SSOs/OUTFALLS

**DJ MAINTENANCE**

- PUBLIC / PRIVATE / BOTH / NA
- ACTIVE / HISTORIC / BOTH / NA
- YOUNG-SUCCESSION-OLD
- SPRAY / SNAG / REMOVED
- MODIFIED / DIPPED OUT / NA
- LEVEED / ONE SIDED
- RELOCATED / CUTOFFS
- MOVING-BEDLOAD-STABLE
- ARMURED / SLUMPS
- ISLANDS / SCOURED
- IMPOUNDED / DESICCATED
- FLOOD CONTROL / DRAINAGE

**EJ ISSUES**

- WWTP / CSO / NPDES / INDUSTRY
- HARDENED / URBAN / DIRT&GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK / EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND / STAGNANT
- PARK / GOLF / LAWN / HOME
- ATMOSPHERE / DATA PAUCITY

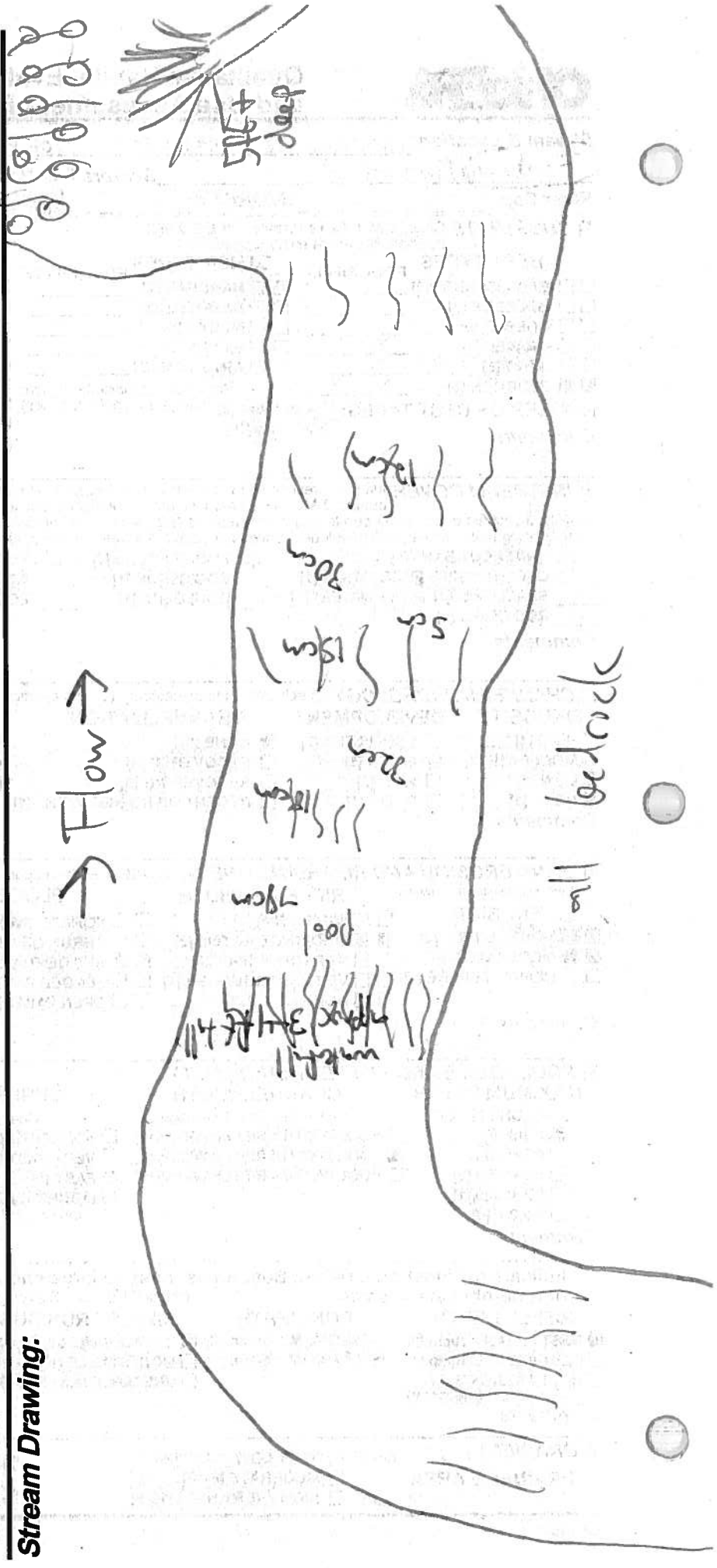
**FJ MEASUREMENTS**

- $\bar{x}$  width
- $\bar{x}$  depth
- max. depth
- $\bar{x}$  bankfull width
- bankfull  $\bar{x}$  depth
- W/D ratio
- bankfull max. depth
- floodprone  $x^2$  width
- entrench. ratio

**CJ RECREATION**

AREA DEPTH  
POOL:  >100ft<sup>2</sup>  >3ft

**Stream Drawing:**



**Stream & Location:** Brandywine creek (Brandywine ski Resort) **RM:** 0.45 **Date:** 07/27/17

D. Friedman **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

**River Code:** - **STORET #:** - **Lat./ Long.:** 41.2865 181.5589 (NAD 83 - decimal) **Office verified location**

**1) SUBSTRATE** Check **ONLY** Two substrate **TYPE BOXES**; estimate % or note every type present

|  |                                     |   |                                     |  |  |
|--|-------------------------------------|---|-------------------------------------|--|--|
| <b>BEST TYPES</b>                              | <b>POOL RIFFLE</b>                  | <b>OTHER TYPES</b>                      | <b>POOL RIFFLE</b>                  | <b>ORIGIN</b>                          | <b>QUALITY</b>                               |
| <input type="checkbox"/> BLDR/SLABS [10]       | <input checked="" type="checkbox"/> | <input type="checkbox"/> HARDPAN [4]    | <input checked="" type="checkbox"/> | <input type="checkbox"/> LIMESTONE [1] | <input type="checkbox"/> HEAVY [-2]          |
| <input type="checkbox"/> BOULDER [9]           | <input checked="" type="checkbox"/> | <input type="checkbox"/> DETRITUS [3]   | <input type="checkbox"/>            | <input type="checkbox"/> TILLS [1]     | <input type="checkbox"/> MODERATE [-1]       |
| <input checked="" type="checkbox"/> COBBLE [8] | <input checked="" type="checkbox"/> | <input type="checkbox"/> MUCK [2]       | <input type="checkbox"/>            | <input type="checkbox"/> WETLANDS [0]  | <input type="checkbox"/> NORMAL [0]          |
| <input type="checkbox"/> GRAVEL [7]            | <input checked="" type="checkbox"/> | <input type="checkbox"/> SILT [2]       | <input type="checkbox"/>            | <input type="checkbox"/> HARDPAN [0]   | <input checked="" type="checkbox"/> FREE [1] |
| <input checked="" type="checkbox"/> SAND [6]   | <input checked="" type="checkbox"/> | <input type="checkbox"/> ARTIFICIAL [0] | <input checked="" type="checkbox"/> | <input type="checkbox"/> SANDSTONE [0] | <input type="checkbox"/> EXTENSIVE [-2]      |
| <input type="checkbox"/> BEDROCK [5]           | <input type="checkbox"/>            |   |                                     | <input type="checkbox"/> RIP/RAP [0]   | <input type="checkbox"/> MODERATE [-1]       |

NUMBER OF BEST TYPES:  4 or more [2]  3 or less [0]

**Comments:** 8+6+2+0.5+0.5+0

**2) INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

|                                     |                            |                                 |   |
|-------------------------------------|----------------------------|---------------------------------|---|
| <b>UNDERCUT BANKS [1]</b>           | <b>POOLS &gt; 70cm [2]</b> | <b>OXBOWS, BACKWATERS [1]</b>   | <b>AMOUNT</b>   |
| <u>2</u>                            | <u>2</u>                   | <u>2</u>                        | Check ONE (Or 2 & average)                              |
| <b>OVERHANGING VEGETATION [1]</b>   | <b>ROOTWADS [1]</b>        | <b>AQUATIC MACROPHYTES [1]</b>  | <input type="checkbox"/> EXTENSIVE >75% [11]            |
| <u>1</u>                            | <u>1</u>                   | <u>1</u>                        | <input checked="" type="checkbox"/> MODERATE 25-75% [7] |
| <b>SHALLOWS (IN SLOW WATER) [1]</b> | <b>BOULDERS [1]</b>        | <b>LOGS OR WOODY DEBRIS [1]</b> | <input type="checkbox"/> SPARSE 5-<25% [3]              |
| <u>1</u>                            | <u>1</u>                   | <u>3</u>                        | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |
| <b>ROOTMATS [1]</b>                 |                            |                                 |   |
| <u>1</u>                            |                            |                                 |   |

**Comments:** Many pools + woody debris 9+7

**Cover Maximum 20** 16

**3) CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

|  |  |  |  |
|--|--|--|--|
| <b>SINUOSITY</b>                                 | <b>DEVELOPMENT</b>                           | <b>CHANNELIZATION</b>                              | <b>STABILITY</b>                                 |
| <input type="checkbox"/> HIGH [4]                | <input type="checkbox"/> EXCELLENT [7]       | <input checked="" type="checkbox"/> NONE [6]       | <input type="checkbox"/> HIGH [3]                |
| <input checked="" type="checkbox"/> MODERATE [3] | <input checked="" type="checkbox"/> GOOD [5] | <input type="checkbox"/> RECOVERED [4]             | <input checked="" type="checkbox"/> MODERATE [2] |
| <input type="checkbox"/> LOW [2]                 | <input type="checkbox"/> FAIR [3]            | <input type="checkbox"/> RECOVERING [3]            | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> NONE [1]                | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |  |

**Comments:** 3+5+6+2

**Channel Maximum 20** 16

**4) BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

|   |   |   |
|---|---|---|
| <b>EROSION</b>  | <b>RIPARIAN WIDTH</b>                         | <b>FLOOD PLAIN QUALITY</b>                                |
| <input checked="" type="checkbox"/> NONE / LITTLE [3] | <input type="checkbox"/> WIDE > 50m [4]       | <input type="checkbox"/> FOREST, SWAMP [3]                |
| <input type="checkbox"/> MODERATE [2]                 | <input type="checkbox"/> MODERATE 10-50m [3]  | <input type="checkbox"/> SHRUB OR OLD FIELD [2]           |
| <input type="checkbox"/> HEAVY / SEVERE [1]           | <input type="checkbox"/> NARROW 5-10m [2]     | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] |
|   | <input type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> FENCED PASTURE [1]               |
|   | <input type="checkbox"/> NONE [0]             | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]        |
|   |   | <input type="checkbox"/> CONSERVATION TILLAGE [1]         |
|   |   | <input type="checkbox"/> URBAN OR INDUSTRIAL [0]          |
|   |   | <input type="checkbox"/> MINING / CONSTRUCTION [0]        |

**Comments:** 2.5+2.5+4

**Riparian Maximum 10** 9

**5) POOL / GLIDE AND RIFFLE / RUN QUALITY**

|  |   |  |
|--|---|--|
| <b>MAXIMUM DEPTH</b>                         | <b>CHANNEL WIDTH</b>  | <b>CURRENT VELOCITY</b>                          |
| Check ONE (ONLY)                             | Check ONE (Or 2 & average)  | Check ALL that apply                             |
| <input checked="" type="checkbox"/> > 1m [6] | <input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2] | <input type="checkbox"/> TORRENTIAL [-1]         |
| <input type="checkbox"/> 0.7-<1m [4]         | <input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]            | <input checked="" type="checkbox"/> SLOW [1]     |
| <input type="checkbox"/> 0.4-<0.7m [2]       | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input type="checkbox"/> VERY FAST [1]           |
| <input type="checkbox"/> 0.2-<0.4m [1]       |   | <input type="checkbox"/> INTERSTITIAL [-1]       |
| <input type="checkbox"/> < 0.2m [0]          |   | <input checked="" type="checkbox"/> FAST [1]     |
|  |   | <input type="checkbox"/> INTERMITTENT [-2]       |
|  |   | <input checked="" type="checkbox"/> MODERATE [1] |
|  |   | <input checked="" type="checkbox"/> EDDIES [1]   |

**Comments:** 6+2+4

**Pool / Current Maximum 12** 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average).  NO RIFFLE [metric=0]

|   |  |  |   |
|---|--|--|---|
| <b>RIFFLE DEPTH</b>                                       | <b>RUN DEPTH</b>                                       | <b>RIFFLE / RUN SUBSTRATE</b>  | <b>RIFFLE / RUN EMBEDDEDNESS</b>            |
| <input checked="" type="checkbox"/> BEST AREAS > 10cm [2] | <input checked="" type="checkbox"/> MAXIMUM > 50cm [2] | <input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2] | <input type="checkbox"/> NONE [2]           |
| <input type="checkbox"/> BEST AREAS 5-10cm [1]            | <input type="checkbox"/> MAXIMUM < 50cm [1]            | <input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]          | <input checked="" type="checkbox"/> LOW [1] |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |  | <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]        | <input type="checkbox"/> MODERATE [0]       |
|   |  |  | <input type="checkbox"/> EXTENSIVE [-1]     |

**Comments:** 2+2+1.5+1

**Riffle / Run Maximum 8** 5.5

**6) GRADIENT** (47.62 ft/mi)  VERY LOW - LOW [2-4]  MODERATE [6-10]  HIGH - VERY HIGH [10-6]

**DRAINAGE AREA** ( 27.00mi<sup>2</sup>)

**% POOL:**  **% GLIDE:**

**% RUN:**  **% RIFFLE:**

**Gradient Maximum 10** 4

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

**AJ SAMPLED REACH**  
Check ALL that apply

**METHOD**

BOAT  
 WADE  
 L. LINE  
 OTHER

**STAGE**

1st -sample pass-- 2nd

HIGH  
 UP  
 NORMAL  
 LOW  
 DRY

**DISTANCE**

0.5 Km  
 0.2 Km  
 0.15 Km  
 0.12 Km  
 OTHER

**CLARITY**

1st 2nd

< 20 cm  
 20-40 cm  
 40-70 cm  
 > 70 cm/ CTB

SECCHI DEPTH

1st 2nd

\_\_\_\_\_ cm \_\_\_\_\_ cm

**CANOPY**

> 85% - OPEN  
 55%-48%  
 30%-55%  
 10%-<30%  
 <10% - CLOSED

**CJ RECREATION**

AREA DEPTH

POOL:  >100m<sup>2</sup>  >3ft

**BJ AESTHETICS**

NUISANCE ALGAE  
 INVASIVE MACROPHYTES  
 EXCESS TURBIDITY  
 DISCOLORATION  
 FOAM/ SCUM  
 OIL SHEEN  
 TRASH/ LITTER  
 NUISANCE ODOR  
 SLUDGE DEPOSITS  
 CSOs/SSOs/OUTFALLS

**DJ MAINTENANCE**

PUBLIC / PRIVATE / BOTH / NA  
 ACTIVE / HISTORIC / BOTH / NA  
 YOUNG-SUCCESSION-OLD  
 SPRAY / SNAG / REMOVED  
 MODIFIED / DIPPED OUT / NA  
 LEVEED / ONE SIDED  
 RELOCATED / CUTOFFS  
 MOVING-BEDLOAD-STABLE  
 ARMoured / SLUMPS  
 ISLANDS / SCoured  
 IMPOUNDED / DESICCATED  
 FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

**EJ ISSUES**

WWTP / CSO / NPDES / INDUSTRY  
 HARDENED / URBAN / DIRT & GRIME  
 CONTAMINATED / LANDFILL  
 BMPs-CONSTRUCTION-SEDIMENT  
 LOGGING / IRRIGATION / COOLING  
 BANK / EROSION / SURFACE  
 FALSE BANK / MANURE / LAGOON  
 WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
 ACID / MINE / QUARRY / FLOW  
 NATURAL / WETLAND / STAGNANT  
 PARK / GOLF / LAWN / HOME  
 ATMOSPHERE / DATA PAUCITY

**FJ MEASUREMENTS**

width  
 depth  
 max. depth  
 bankfull width  
 bankfull depth  
 W/D ratio  
 bankfull max. depth  
 floodprone x<sup>2</sup> width  
 entrench. ratio  
 Legacy Tree:

**Stream Drawing:**

