



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 2174 Salem Creek

Submitted by
MEC/ERC

To
Missouri Department of Natural Resources
Water Protection Program

On

November 14, 2008

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet A – Water Body Identification

I. Water Body Information (for water body being surveyed)

| | |
|---|------------------------|
| Water Body Name (from USGS 7.5' quad): | Salem Creek |
| Missouri Water Body Identification (WBID) Number: | 2174 |
| 8-digit HUC: | 07140104 |
| County(ies), Listed Upstream to Downstream: | St. Francois |
| Upstream Legal Description (from Table H): | Mouth |
| Downstream Legal Description (from Table H): | 26, 37N, SE |
| Number of sites evaluated: | 3 |
| List all site numbers, <u>consecutively upstream to downstream</u> : | Site 3, Site 2, Site 1 |
| Include a Site Location Map(s). The map must include all requirements detailed in the <i>Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol</i> (Section IV.D.8.a). | |

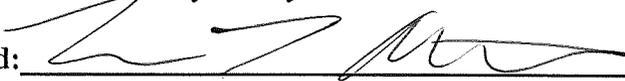
II. Facility Information (list all permitted discharges to this water body segment)

| |
|---|
| Facility Name(s) and Permit Number(s): Hunter's Ridge Subdivision Wastewater Treatment Plant MO-0121371 |
|---|

III. UAA Surveyor (please **PRINT** legibly)

| |
|---|
| Name of Surveyor: T. Althether, J. VeVerto Telephone Number: 573-443-4100 |
| Organization/Employer: MEC Water Resources |

Please verify that you have completed all sections of all data sheets, checked all applicable boxes, provided a map (that includes all requirements listed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*) and that this form is complete.

Signed:  Date: 5/15/08

RUC 5-20-08

Eaton Branch WBID: 2166 3 mi.

Koen Creek WBID: 2171 1 mi.

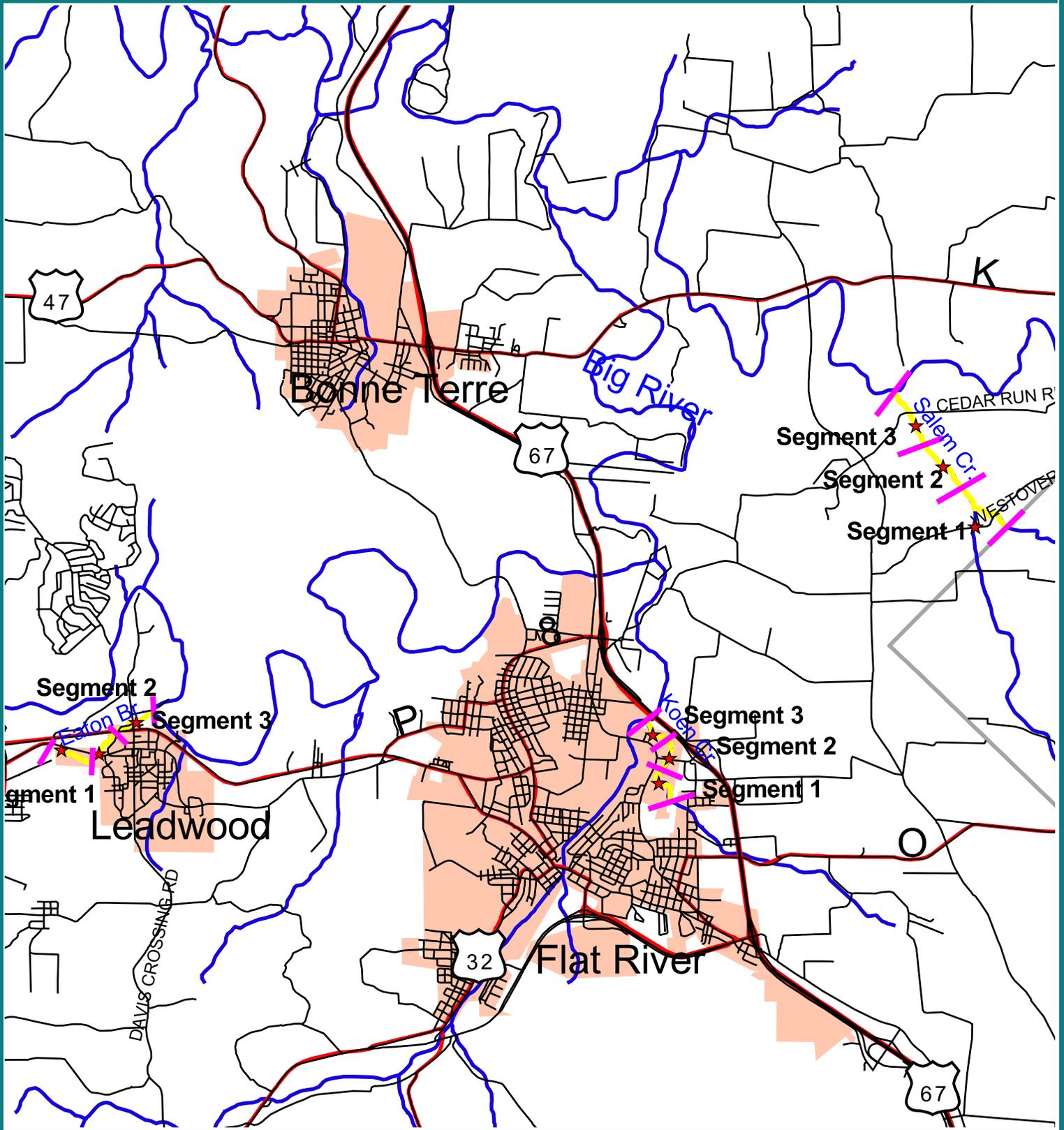
Salem Creek WBID: 2174 2 mi.



Survey Reach



Survey Points



WBID # 2174

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

| | |
|---|---|
| Date & Time: <u>05/01/08 13:52</u> | Location Description (e.g., road crossing): <u>off of Cedar Ln</u> |
| Stream Name: <u>Salem Creek</u> | |
| Current Weather Conditions: <u>Overcast, 67°F, Breezy</u> | Facility Name(s): <u>Hunter's Ridge Subdivision</u> |
| Weather Conditions for Past 10 days: <u>0.50 in rain, Clear</u> | Permit Number(s): <u>MO-0121371</u> |
| Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | |
|--|---|--|
| Site 01 | <u>North (UTM Y): 4198822</u> <u>East (UTM X): 6725866</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>10.7</u> Meters |
| Site 11 | <u>North (UTM Y): 4199068</u> <u>East (UTM X): 6725775</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>7.5</u> Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|------------------|------------------|------------------|--------------------|-----------|---------------|
| <u>2174-L035</u> | <u>Up Stream</u> | <u>2174-L036</u> | <u>Down Stream</u> | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use Data Sheet D- Recreational Use Interview when conducting interviews.) <u>NA</u> | | | | |

Stream Name & WBID # Salem Creek, 2174
 Site # 1

Date of Survey 05/01/08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|--|--------------------------------------|---|--|---|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input checked="" type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input checked="" type="checkbox"/> Other: <u>Pasture</u> |
| Comments: <p style="text-align: center;"><u>N/A</u></p> | | | | |

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

| | | | | |
|---|--|--|---|---|
| <input type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input checked="" type="checkbox"/> None of the above | Comments / Other: <p style="text-align: center;"><u>N/A</u></p> | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|--------------------|--------------------|--------|--------|------------|---------------------|
| <u>20</u> % Cobble | <u>10</u> % Gravel | % Sand | % Silt | % Mud/Clay | <u>70</u> % Bedrock |
|--------------------|--------------------|--------|--------|------------|---------------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Periphyton common, grasses

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---------------------------------|---|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input type="checkbox"/> Fine sediments | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input type="checkbox"/> Foam | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Stream Name & WBID # Salem Creek, 2174

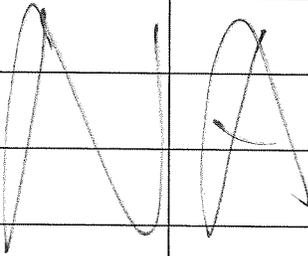
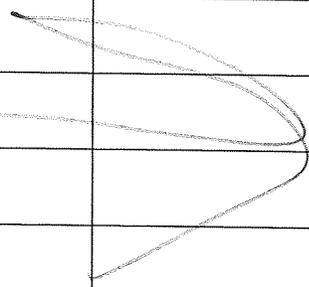
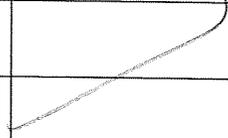
Date of Survey 05/01/08

Site # 1

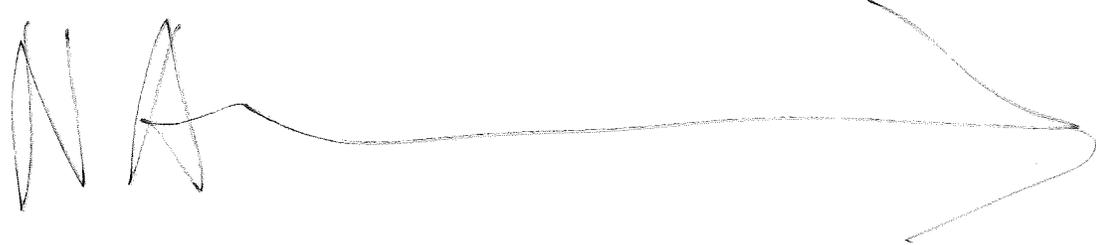
Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|---|-----------------------------------|-----------|------------|------------------|---------------|
|  | | | | | |
|  | | | | | |
|  | | | | | |
|  | | | | | |
|  | | | | | |

Comments: (Please record any additional comments here.)



Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: James Walker, Tim Albrecht

Surveyor's Signature: [Signature] Date of Survey: 05/01/08

Organization: MEC Water Position: Water Quality Scientist

24C 5-70-08

Field Data Sheets for Recreational Use Stream Surveys
Data Sheet C - Field Survey Results

| | |
|--|---|
| Stream Name: <u>Salem Creek</u> Waterbody ID: <u>2174</u> Site #: <u>1</u> Estimated Channel Incision: <u>0</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>723866</u> UTM Y: <u>4198822</u> +/- <u>10.7(meters)</u> 11 UTM X: <u>723775</u> UTM Y: <u>4199018</u> +/- <u>7.5(meters)</u> Average Stream Width: <u>10</u> (meters) Length of Survey Segment: <u>200(meters)</u> (To determine Length of Reach) (20x average stream width) Field Staff: <u>TA, JV</u> | <p align="center">Dissolved Oxygen</p> Date: <u>5/1/2008</u> Time: <u>13:52</u> Dissolved Oxygen: <u>11.74</u> (mg/L) Dissolved Oxygen: <u>124.9</u> (% sat) Specific Cond: <u>407.1</u> (µS/cm) Water Temperature: <u>18.4</u> (°C) |
|--|---|

rwc

| Transect Cross-Section | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | | |
| Station | Distance (m) | Depth (m) |
| Left Bank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1.52 | 0.08 | 1.52 | 0.12 | 2.09 | 0.21 | 1.06 | 0.19 | 2.27 | 0.00 | 1.43 | 0.11 | 1.38 | 0.06 | 1.67 | 0.05 | 1.28 | 0.04 | 1.37 | 0.06 | 0.66 | 0.11 |
| 2 | 3.04 | 0.04 | 3.04 | 0.12 | 4.18 | 0.18 | 2.12 | 0.15 | 4.54 | 0.01 | 2.86 | 0.08 | 2.76 | 0.04 | 3.34 | 0.05 | 2.56 | 0.03 | 2.74 | 0.04 | 1.32 | 0.10 |
| 3 | 4.56 | 0.01 | 4.56 | 0.10 | 6.27 | 0.34 | 3.18 | 0.10 | 6.81 | 0.01 | 4.29 | 0.04 | 4.14 | 0.01 | 5.01 | 0.04 | 3.84 | 0.03 | 4.11 | 0.02 | 1.98 | 0.10 |
| 4 | 6.08 | 0.00 | 6.08 | 0.09 | 8.36 | 0.30 | 4.24 | 0.07 | 9.08 | 0.00 | 5.72 | 0.02 | 5.52 | 0.00 | 6.68 | 0.03 | 5.12 | 0.04 | 5.48 | 0.02 | 2.64 | 0.08 |
| 5 | 7.60 | 0.04 | 7.60 | 0.09 | 10.45 | 0.30 | 5.30 | 0.05 | 11.35 | 0.04 | 7.15 | 0.17 | 6.90 | 0.02 | 8.35 | 0.03 | 6.40 | 0.04 | 6.85 | 0.02 | 3.30 | 0.09 |
| 6 | 9.12 | 0.18 | 9.12 | 0.19 | 12.54 | 0.00 | 6.36 | 0.00 | 13.62 | 0.04 | 8.58 | 0.14 | 8.28 | 0.05 | 10.02 | 0.02 | 7.68 | 0.03 | 8.22 | 0.04 | 3.96 | 0.07 |
| 7 | 10.64 | 0.13 | 10.64 | 0.16 | 14.63 | 0.10 | 7.42 | 0.03 | 15.89 | 0.05 | 10.01 | 0.10 | 9.66 | 0.01 | 11.69 | 0.03 | 8.96 | 0.04 | 9.59 | 0.05 | 4.62 | 0.03 |
| 8 | 12.16 | 0.11 | 12.16 | 0.13 | 16.72 | 0.05 | 8.48 | 0.00 | 18.16 | 0.01 | 11.44 | 0.06 | 11.04 | 0.00 | 13.36 | 0.02 | 10.24 | 0.05 | 10.96 | 0.07 | 5.28 | 0.02 |
| 9 | 13.60 | 0.07 | 13.68 | 0.06 | 18.81 | 0.06 | 9.54 | 0.06 | 20.43 | 0.00 | 12.87 | 0.04 | 12.42 | 0.04 | 15.03 | 0.08 | 11.52 | 0.02 | 12.33 | 0.03 | 5.94 | 0.00 |
| Right Bank | 15.20 | 0.00 | 15.20 | 0.00 | 20.90 | 0.00 | 10.60 | 0.00 | 22.70 | 0.00 | 14.30 | 0.00 | 13.80 | 0.00 | 16.70 | 0.00 | 12.80 | 0.00 | 13.70 | 0.00 | 6.60 | 0.00 |
| Feature Type (riffle, run, or pool) | Riffle | | Run | | Run | | Run | | Riffle | | Run | | Riffle | | Run | | Run | | Run | | Run | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____

WBID # 2174

Site # 2

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)
(must be completed for each site)

| | |
|---|---|
| Date & Time: <u>05/01/08 14:34</u> | Location Description (e.g., road crossing): <u>up stream off of Cedar Run Rd</u> |
| Stream Name: <u>Salem Creek</u> | |
| Current Weather Conditions: <u>Overcast, 65°F, Breezy</u> | Facility Name(s): <u>Hunter's Ridge Subdivision</u> |
| Weather Conditions for Past 10 days: <u>0.50, Clear, 1st. City.</u> | Permit Number(s): <u>MO 0121371</u> |
| Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--|--|--|
| Site 01 | Northing (UTM Y) Easting (UTM X): <u>4198187</u> | Northing (UTM Y) Easting (UTM X): <u>0724288</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>4.8</u> Meters |
| Site 11 | Northing (UTM Y) Easting (UTM X): <u>4198826</u> | Northing (UTM Y) Easting (UTM X): <u>0724165</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>14.7</u> Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-------------------|------------------|-------------------|--------------------|-----------|---------------|
| <u>2174.2.037</u> | <u>Up Stream</u> | <u>2174.2.038</u> | <u>Down Stream</u> | | |
| | | | | | |
| | | | | | |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|---------------------------------------|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |

Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use Data Sheet D- Recreational Use Interview when conducting interviews.)

N/A

Stream Name & WBID # Salam Creek, 2174
 Site # 2

Date of Survey 05/01/08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|---|--------------------------------------|---|--|---|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input checked="" type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input checked="" type="checkbox"/> Steep slopes | <input checked="" type="checkbox"/> Other: <u>Pasture</u> |
| Comments: <p style="text-align: center;">N/A</p> | | | | |

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

| | | | | |
|---|--|--|---|---|
| <input type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input checked="" type="checkbox"/> None of the above | Comments / Other: <p style="text-align: center;">N/A</p> | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|--------------------|----------|--------|--------|------------|---------------------|
| <u>30</u> % Cobble | % Gravel | % Sand | % Silt | % Mud/Clay | <u>70</u> % Bedrock |
|--------------------|----------|--------|--------|------------|---------------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Periphyton abundant, grasses and willow

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---------------------------------|---|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input type="checkbox"/> Fine sediments | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input type="checkbox"/> Foam | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Stream Name & WBID # Salem Creek, 2174
 Site # 2

Date of Survey 05/01/08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

N/A

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: James Vetterka, Tim Althoff

Surveyor's Signature: Date of Survey: 5/01/08

Organization: MEC Water Position: Water Quality Scientist

AUC 5-20-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|--|--|
| Stream Name: <u>Salem Creek</u> Waterbody ID: <u>2174</u> Site #: <u>2</u> Estimated Channel Incision: <u>0.00</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>724288</u> UTM Y: <u>4198187</u> +/- <u>4.8</u> (meters) 11 UTM X: <u>724165</u> UTM Y: <u>4198326</u> +/- <u>14.7</u> (meters) Average Stream Width: <u>10</u> (meters) Length of Survey Segment: <u>200</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>TA, JV</u> | <h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>5/1/2008</u> Time: <u>14:34</u> Dissolved Oxygen: <u>11.74</u> (mg/L) Dissolved Oxygen: <u>123.6</u> (% sat) Specific Cond: <u>416.3</u> (µS/cm) Water Temperature: <u>18</u> (°C) |
|--|--|

Transect Cross-Section

| Station | | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|---|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| | | Distance (m) | Depth (m) |
| Left Bank | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 1 | 0.68 | 0.08 | 2.05 | 0.20 | 1.60 | 0.08 | 0.76 | 0.21 | 1.38 | 0.19 | 1.36 | 0.20 | 1.05 | 0.14 | 1.18 | 0.24 | 1.26 | 0.11 | 0.49 | 0.00 | 0.76 | 0.12 |
| | 2 | 1.36 | 0.05 | 4.10 | 0.18 | 3.20 | 0.05 | 1.52 | 0.29 | 2.72 | 0.26 | 2.72 | 0.17 | 2.10 | 0.24 | 2.36 | 0.20 | 2.52 | 0.08 | 0.98 | 0.00 | 1.52 | 0.11 |
| | 3 | 2.04 | 0.23 | 6.15 | 0.11 | 4.80 | 0.02 | 2.28 | 0.26 | 4.14 | 0.25 | 4.08 | 0.12 | 3.15 | 0.20 | 3.54 | 0.21 | 3.78 | 0.12 | 1.47 | 0.00 | 2.28 | 0.08 |
| | 4 | 2.72 | 0.21 | 8.20 | 0.06 | 6.40 | 0.07 | 3.04 | 0.22 | 5.52 | 0.32 | 5.44 | 0.11 | 4.20 | 0.16 | 4.72 | 0.15 | 5.04 | 0.09 | 1.96 | 0.04 | 3.04 | 0.06 |
| | 5 | 3.40 | 0.21 | 10.25 | 0.10 | 8.00 | 0.03 | 3.80 | 0.22 | 6.90 | 0.36 | 6.80 | 0.10 | 5.25 | 0.18 | 5.90 | 0.11 | 6.30 | 0.08 | 2.45 | 0.03 | 3.80 | 0.06 |
| | 6 | 4.08 | 0.21 | 12.30 | 0.06 | 9.60 | 0.09 | 4.56 | 0.09 | 8.28 | 0.24 | 8.16 | 0.10 | 6.30 | 0.15 | 7.08 | 0.09 | 7.56 | 0.10 | 2.94 | 0.00 | 4.56 | 0.06 |
| | 7 | 4.76 | 0.20 | 14.35 | 0.04 | 11.20 | 0.05 | 5.32 | 0.15 | 9.66 | 0.16 | 9.52 | 0.06 | 7.35 | 0.10 | 8.26 | 0.07 | 8.82 | 0.06 | 3.43 | 0.00 | 5.32 | 0.05 |
| | 8 | 5.44 | 0.21 | 16.40 | 0.10 | 12.80 | 0.04 | 6.08 | 0.15 | 11.04 | 0.17 | 10.88 | 0.06 | 8.40 | 0.08 | 9.44 | 0.02 | 10.08 | 0.03 | 3.92 | 0.04 | 6.08 | 0.04 |
| | 9 | 6.12 | 0.19 | 18.45 | 0.19 | 14.40 | 0.26 | 6.84 | 0.15 | 12.42 | 0.17 | 12.24 | 0.05 | 9.45 | 0.04 | 10.62 | 0.01 | 11.34 | 0.05 | 4.41 | 0.05 | 6.84 | 0.02 |
| Right Bank | | 6.80 | 0.00 | 20.50 | 0.00 | 16.00 | 0.00 | 7.60 | 0.00 | 13.80 | 0.00 | 13.60 | 0.00 | 10.50 | 0.00 | 11.80 | 0.00 | 12.60 | 0.00 | 4.90 | 0.00 | 7.60 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | | Run | | Riffle | | Riffle | | Run | | Riffle | | Run | |

rwc

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____

WBID # 2174
 Site # 3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)
 (must be completed for each site)

| | |
|---|--|
| Date & Time: <u>05/01/08 13:30</u> | Location Description (e.g., road crossing): <u>off of Westover Rd</u> |
| Stream Name: <u>Salem Creek</u> | |
| Current Weather Conditions: <u>overcast, 65 F, Breezy</u> | Facility Name(s): <u>Hunter's Ridge Subdivision</u> |
| Weather Conditions for Past 10 days: <u>0.56 in rain, Pt. Cloudy, Clear</u> | Permit Number(s): <u>MO 0121571</u> |
| Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--|--|---|
| Site 01 | Northing (UTM Y) Easting (UTM X): <u>4197259</u> | Northing (UTM Y) Easting (UTM X): <u>0724785</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>11.3</u> Meters |
| Site 11 | Northing (UTM Y) Easting (UTM X): <u>4197438</u> | Northing (UTM Y) Easting (UTM X): <u>0724798</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>8.9</u> Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-------------------|------------------|-------------------|--------------------|-----------|---------------|
| <u>2174-3-039</u> | <u>Up Stream</u> | <u>2174-3-040</u> | <u>Down Stream</u> | | |
| | | | | | |
| | | | | | |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|---|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use Data Sheet D- Recreational Use Interview when conducting interviews.) <u>N/A</u> | | | | |

Stream Name & WBID # Salem Creek, 2174

Date of Survey 05/01/08

Site # 5

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|---|--------------------------------------|---|--|---|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input checked="" type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input checked="" type="checkbox"/> Steep slopes | <input checked="" type="checkbox"/> Other: <u>Pasture</u> |
| Comments: <p style="text-align: center;">N/A</p> | | | | |

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

| | | | | |
|---|---|--|---|---|
| <input type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input checked="" type="checkbox"/> None of the above | Comments / Other: <p style="text-align: center;">N/A</p> | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|--------------------|--------------------|------------------|--------|------------|---------------------|
| <u>10</u> % Cobble | <u>10</u> % Gravel | <u>10</u> % Sand | % Silt | % Mud/Clay | <u>70</u> % Bedrock |
|--------------------|--------------------|------------------|--------|------------|---------------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

periphyton abundant, grasses

N/A

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---------------------------------|---|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input type="checkbox"/> Fine sediments | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input type="checkbox"/> Foam | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Stream Name & WBID # Salmon Creek, 2174

Date of Survey 05/01/08

Site # 3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| N/A | N/A | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

N/A

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: James Velverka, Tim Alford

Surveyor's Signature: [Signature] Date of Survey: 05/01/08

Organization: MBC Water Position: Water Quality Scientist

AUC 5-20-08

Field Data Sheets for Recreational Use Stream Surveys
Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Salem Creek</u> Waterbody ID: <u>2174</u> Site #: <u>3</u> Estimated Channel Incision: <u>0</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>724785</u> UTM Y: <u>4197259</u> +/- <u>11.3(meters)</u> 11 UTM X: <u>724798</u> UTM Y: <u>4197438</u> +/- <u>8.9(meters)</u> Average Stream Width: <u>10</u> (meters) Length of Survey Segment: <u>200(meters)</u> (To determine Length of Reach) (20x average stream width) Field Staff: <u>TA/JV</u> | <p align="center">Dissolved Oxygen</p> Date: <u>5/1/2008</u> Time: <u>15:30</u> Dissolved Oxygen: <u>10.83</u> (mg/L) Dissolved Oxygen: <u>113.4</u> (% sat) Specific Cond: <u>429.8</u> (µS/cm) Water Temperature: <u>17.5</u> (°C) |
|---|---|

Transect Cross-Section

| Station | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| | Distance (m) | Depth (m) |
| Left Bank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1.05 | 0.11 | 0.93 | 0.06 | 1.31 | 0.46 | 1.29 | 0.35 | 1.26 | 0.18 | 1.08 | 0.19 | 1.14 | 0.25 | 1.94 | 0.30 | 1.42 | 0.27 | 1.21 | 0.21 | 1.07 | 0.19 |
| 2 | 2.10 | 0.11 | 1.86 | 0.36 | 2.62 | 0.49 | 2.58 | 0.56 | 2.52 | 0.15 | 2.16 | 0.21 | 2.28 | 0.28 | 3.88 | 0.25 | 2.84 | 0.22 | 2.42 | 0.21 | 2.14 | 0.20 |
| 3 | 3.15 | 0.09 | 2.79 | 0.43 | 3.93 | 0.47 | 3.87 | 0.51 | 3.78 | 0.15 | 3.24 | 0.20 | 3.42 | 0.29 | 5.82 | 0.19 | 4.26 | 0.19 | 3.63 | 0.22 | 3.21 | 0.21 |
| 4 | 4.20 | 0.05 | 3.72 | 0.38 | 5.24 | 0.55 | 5.16 | 0.55 | 5.04 | 0.15 | 4.32 | 0.18 | 4.56 | 0.31 | 7.76 | 0.16 | 5.68 | 0.14 | 4.84 | 0.28 | 4.28 | 0.20 |
| 5 | 5.25 | 0.00 | 4.65 | 0.34 | 6.55 | 0.58 | 6.45 | 0.53 | 6.30 | 0.14 | 5.40 | 0.17 | 5.70 | 0.34 | 9.70 | 0.00 | 7.10 | 0.00 | 6.05 | 0.25 | 5.35 | 0.20 |
| 6 | 6.30 | 0.00 | 5.58 | 0.31 | 7.86 | 0.41 | 7.74 | 0.52 | 7.56 | 0.13 | 6.48 | 0.17 | 6.84 | 0.36 | 11.64 | 0.00 | 8.52 | 0.00 | 7.26 | 0.23 | 6.42 | 0.19 |
| 7 | 7.35 | 0.00 | 6.51 | 0.36 | 9.17 | 0.40 | 9.03 | 0.51 | 8.82 | 0.14 | 7.56 | 0.17 | 7.98 | 0.39 | 13.58 | 0.02 | 9.94 | 0.01 | 8.47 | 0.20 | 7.49 | 0.15 |
| 8 | 8.40 | 0.00 | 7.44 | 0.44 | 10.48 | 0.40 | 10.32 | 0.51 | 10.08 | 0.11 | 8.64 | 0.17 | 9.12 | 0.43 | 15.52 | 0.00 | 11.36 | 0.09 | 9.68 | 0.19 | 8.56 | 0.12 |
| 9 | 9.45 | 0.01 | 8.37 | 0.07 | 11.79 | 0.36 | 11.61 | 0.49 | 11.34 | 0.06 | 9.72 | 0.17 | 10.26 | 0.20 | 17.46 | 0.00 | 12.78 | 0.06 | 10.89 | 0.15 | 9.63 | 0.09 |
| Right Bank | 10.50 | 0.00 | 9.30 | 0.00 | 13.10 | 0.00 | 12.90 | 0.00 | 12.60 | 0.00 | 10.80 | 0.00 | 11.40 | 0.00 | 19.40 | 0.00 | 14.20 | 0.00 | 12.10 | 0.00 | 10.70 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | Riffle | | Pool | | Pool | | Pool | | Run | | Run | | Run | | Riffle | | Run | | Run | | Run | |

RWC

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
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 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____

WBID #2174

Site 1

Upstream



WBID #2174

Site 1

Down stream



WBID 2174

Site 2

Upstream



WBID 2174

Site 2

Downstream



WBID 2174

Site 3

Upstream



WBID 2174

Site 3

Down stream

