

Missouri  
Department of  
Natural Resources

Use Attainability Analysis

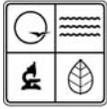
for

WBID 0865 Flat Creek

Submitted by  
Pickett Ray and Silver

To  
Missouri Department of Natural Resources  
Water Protection Program

Date Received: October 31, 2007



Missouri  
 Department of Natural Resources  
**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): Flat Creek	
Missouri Water Body Identification (WBID) Number: 0865	
8-digit HUC: 20080123	County: Pettis
Upstream Legal Description (from Table H): 11, 43N, 23W	
Downstream Legal Description (from Table H): Mouth	
Number of sites evaluated: 13	
List all sites numbers, listed consequently upstream to downstream: 0865_01, 0865_02, 0865_03, 0865_04, 0865_05, 0865_06, 0865_07, 0865_08, 0865_09, 0865_10, 0865_11, 0865_12, 0865_13	

**Site Locations Map(s):** Attach a map of the entire segment with assessment sites clearly labeled. Mark any other items that may be of interest.

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

Facility Name(s) and Permit Number(s): Elm Hills Park – MO 0088382
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**III. UAA Surveyor** (please print legibly)

Name of Surveyor: Renee Martin	Telephone Number: 573-875-7844
Organization/Employer: Applied Environmental Solutions	

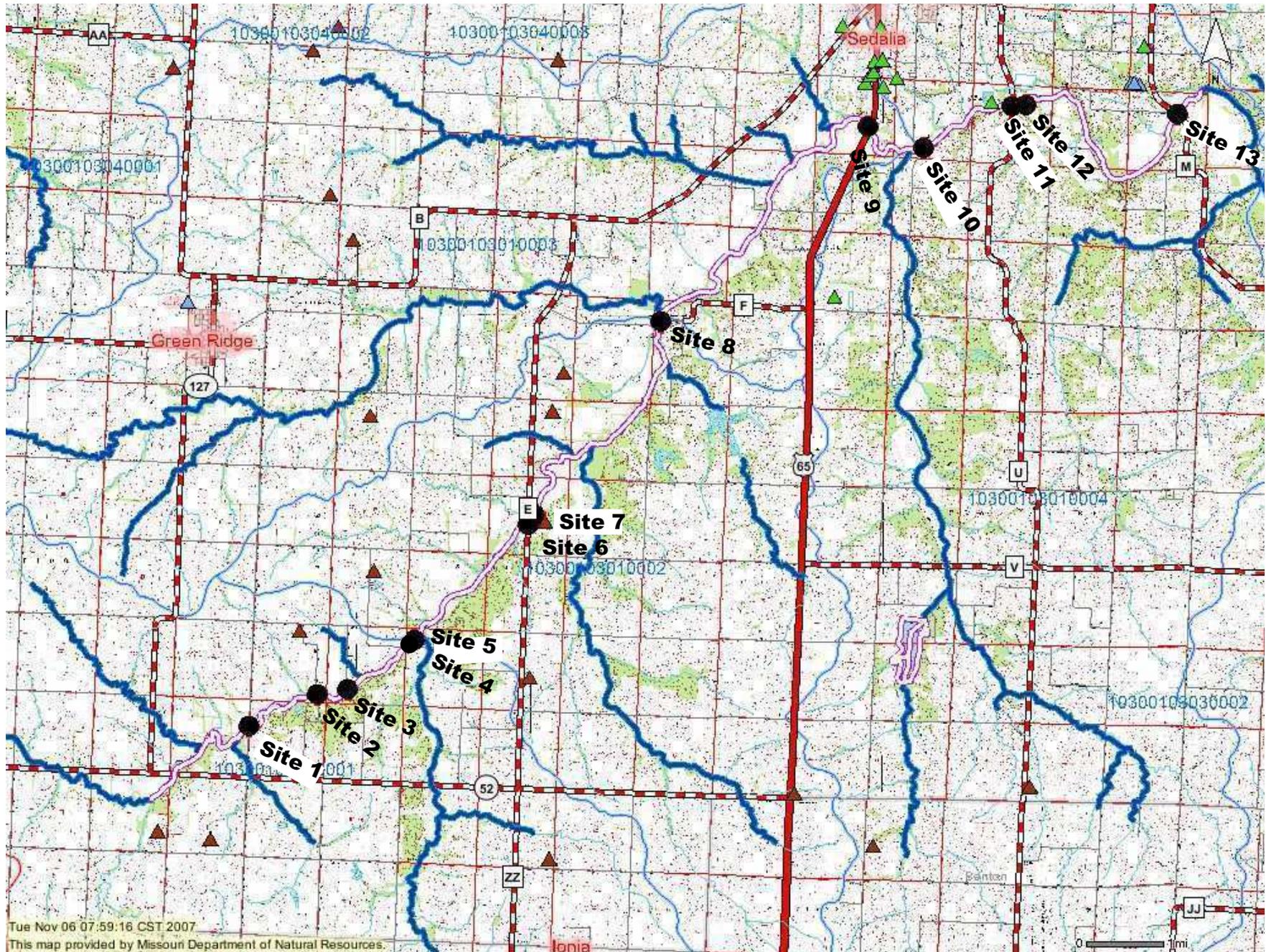
**Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.**

**Signed:** \_\_\_\_\_ **Date:** \_\_\_\_\_

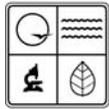
# Flat Creek

# WBID# 0865

# UAA# 0649



This map was created by DNR staff to show all sites on one page JL 11/7/07



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 8:00	Site Location Description (e.g., road crossing): Meyers Rd.
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

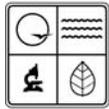
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0465119	Northing (UTM Y): 4266697	Horizontal Accuracy: (EPE / FOM / PDOP) 18 feet
Site 11	Easting (UTM X): 0465296	Northing (UTM Y): 4266705	Horizontal Accuracy: (EPE / FOM / PDOP) 27 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0082	downstream	101_0083	upstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

**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
Comments / Other: None				

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

60% Cobble	35% Gravel	% Sand	% Silt	% Mud/Clay	5% Bedrock
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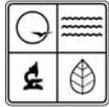
**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Willows
Sedges
Water primrose

**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 type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other: brown, murky
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.



Missouri Department of Natural Resources  
**Field Data Sheets for Recreational Use Stream Surveys**  
Data Sheet B – Site Characterization (continued)

**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.)

Transects 01 and 02 too deep to enter. It is our opinion that depths are >1 m.

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

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>1</u> Estimated Channel Incision: <u>3.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>465119</u> UTM Y: <u>4266697</u> +/- <u>18</u> (feet) <b>11</b> UTM X: <u>465296</u> UTM Y: <u>4266705</u> +/- <u>27</u> (feet)  Average Stream Width: <u>11.5</u> (meters) Length of Survey Segment: <u>230</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>9/15/2007</u> Time: <u>8:00</u>  Dissolved Oxygen: <u>3.64</u> (mg/L)  Dissolved Oxygen: <u>37.6</u> (% sat)  Specific Cond: <u>173.5</u> (µS/cm)  Water Temperature: <u>16.6</u> (°C)  Transects 1 & 2, 1
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>1</b>	2.77	---	1.10	---	0.88	0.37	0.14	0.01	1.10	0.24	1.03	0.19	1.02	0.25	1.05	0.12	0.57	0.12	0.79	0.07	1.04	0.25
	<b>2</b>	5.54	---	2.20	---	1.76	0.46	0.28	0.02	2.20	0.50	2.06	0.27	2.04	0.50	2.10	0.17	1.14	0.21	1.58	0.25	2.08	0.40
	<b>3</b>	8.31	---	3.30	---	2.64	0.50	0.42	0.02	3.30	0.55	3.09	0.33	3.06	0.55	3.15	0.18	1.71	0.25	2.37	0.30	3.12	0.61
	<b>4</b>	11.08	---	4.40	---	3.52	0.56	0.56	0.03	4.40	0.51	4.12	0.39	4.08	0.51	4.20	0.14	2.28	0.17	3.16	0.27	4.16	0.58
	<b>5</b>	13.85	---	5.50	---	4.40	0.50	0.70	0.00	5.50	0.46	5.15	0.44	5.10	0.54	5.25	0.16	2.85	0.40	3.95	0.34	5.20	0.64
	<b>6</b>	16.62	---	6.60	---	5.28	0.42	0.84	0.02	6.60	0.37	6.18	0.45	6.12	0.53	6.30	0.28	3.42	0.35	4.74	0.30	6.24	0.56
	<b>7</b>	19.39	---	7.70	---	6.16	0.28	0.98	0.03	7.70	0.32	7.21	0.45	7.14	0.51	7.35	0.30	3.99	0.30	5.53	0.35	7.28	0.55
	<b>8</b>	22.16	---	8.80	---	7.04	0.22	1.12	0.01	8.80	0.34	8.24	0.38	8.16	0.38	8.40	0.34	4.56	0.22	6.32	0.30	8.32	0.51
	<b>9</b>	24.93	---	9.90	---	7.92	0.17	1.26	0.01	9.90	0.39	9.27	0.35	9.18	0.34	9.45	0.26	5.13	0.20	7.11	0.31	9.36	0.15
<b>Right Bank</b>		27.70	---	11.00	---	8.80	0.00	1.40	0.00	11.05	0.00	10.30	0.27	10.20	0.00	10.50	0.00	5.75	0.00	7.95	0.00	10.40	0.00
<b>Feature Type</b>		Pool		Pool		Run		Riffle		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

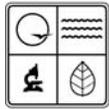
GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

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 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 8:58	Site Location Description (e.g., road crossing): Richardson Rd.
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

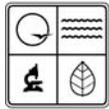
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0466528	Northing (UTM Y): 4267353	Horizontal Accuracy: (EPE / FOM / PDOP) 20 feet
Site 11	Easting (UTM X): 0466743	Northing (UTM Y): 4267320	Horizontal Accuracy: (EPE / FOM / PDOP) 21 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0084	upstream	101_0085	downstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

**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
Comments / Other: None				

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

% Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Water primrose
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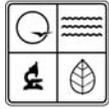
**Water Characteristics\*:** (Mark all that apply.)

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 type="checkbox"/> None	<input checked="" type="checkbox"/> Other: unknown
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 effect another use.

WBID # 0865

Site # 2



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.)

Transects 01, 02, 03, and 04 too deep to enter stream.  
Transects 05-11 bank incision too steep and water too deep to access stream.  
Width taken from bridge.  
Opinion that depths are >1 m.

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

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 09-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

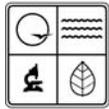
Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>2</u> Estimated Channel Incision: <u>5.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0466528</u> UTM Y: <u>4267353</u> +/- <u>20</u> (feet) <b>11</b> UTM X: <u>0466743</u> UTM Y: <u>4267320</u> +/- <u>21</u> (feet)  Average Stream Width: <u>10.0</u> (meters) Length of Survey Segment: <u>200</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>9/15/2007</u> Time: <u>8:58</u>  Dissolved Oxygen: <u>2.49</u> (mg/L) Dissolved Oxygen: <u>29.3</u> (% sat)  Specific Cond: <u>200.3</u> (µS/cm)  Water Temperature: <u>17.6</u> (°C)  Too steep & deep to
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		2.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2		4.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3		6.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4		8.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5		10.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6		12.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7		14.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8		16.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9		18.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>Right Bank</b>		20.00	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00
<b>Feature Type</b> <small>(riffle, run, or pool)</small>		Pool																					

**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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 9:36	Site Location Description (e.g., road crossing): Bennett Rd.
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

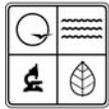
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0467164	Northing (UTM Y): 4267457	Horizontal Accuracy: (EPE / FOM / PDOP) 24 feet
Site 11	Easting (UTM X): 0467324	Northing (UTM Y): 4267550	Horizontal Accuracy: (EPE / FOM / PDOP) 35 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0086	upstream	101_0087	downstream	101_0088	Farm road
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

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

<input checked="" 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
Comments / Other:				

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

75% Cobble	20% Gravel	5% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Water primrose Grasses Willow arrowhead
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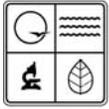
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Other: tannins
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input 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 effect another use.

WBID # 0865

Site # 3



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.)

Transects 01 and 02 too steep and too deep to enter stream.  
Opinion that depths are >1 m.

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

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

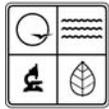
Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>3</u> Estimated Channel Incision: <u>5.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0467164</u> UTM Y: <u>4267457</u> +/- <u>24</u> (feet) <b>11</b> UTM X: <u>0467324</u> UTM Y: <u>4267550</u> +/- <u>35</u> (feet)  Average Stream Width: <u>10.5</u> (meters) Length of Survey Segment: <u>210</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<b>Dissolved Oxygen</b>
	Date: <u>9/15/2007</u> Time: <u>9:36</u>
	Dissolved Oxygen: <u>4.51</u> (mg/L)
	Dissolved Oxygen: <u>44.9</u> (% sat)
	Specific Cond: <u>192.7</u> (µS/cm)
	Water Temperature: <u>14.9</u> (°C)
	Too steep

#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0	0	0	0	
1		1.06	---	1.23	---	1.22	0.26	0.90	0.07	0.30	0.05	0.58	0.12	1.00	0.19	1.18	0.12	1.16	0.25	1.05	0.25	0.51	0.05
2		2.12	---	2.46	---	2.44	0.12	1.80	0.10	0.60	0.01	1.16	0.19	2.00	0.24	2.36	0.15	2.32	0.45	2.10	0.24	1.02	0.00
3		3.18	---	3.69	---	3.66	0.22	2.70	0.01	0.90	0.02	1.74	0.21	3.00	0.26	3.54	0.17	3.48	0.50	3.15	0.25	1.53	0.02
4		4.24	---	4.92	---	4.88	0.25	3.60	0.03	1.20	0.00	2.32	0.28	4.00	0.40	4.72	0.25	4.64	0.61	4.20	0.45	2.04	0.01
5		5.30	---	6.15	---	6.10	0.27	4.50	0.03	1.50	0.00	2.90	0.32	5.00	0.48	5.90	0.36	5.80	0.63	5.25	0.40	2.55	0.00
6		6.36	---	7.38	---	7.32	0.28	5.40	0.00	1.80	0.01	3.48	0.50	6.00	0.50	7.08	0.30	6.96	0.68	6.30	0.52	3.06	0.01
7		7.42	---	8.61	---	8.54	0.30	6.30	0.00	2.10	0.00	4.06	0.53	7.00	0.45	8.26	0.35	8.12	0.58	7.35	0.45	3.57	<.01
8		8.48	---	9.84	---	9.76	0.26	7.20	0.08	2.40	0.00	4.64	0.51	8.00	0.44	9.44	0.32	9.28	0.70	8.40	0.35	4.08	0.00
9		9.54	---	11.07	---	10.98	0.12	8.10	0.06	2.70	0.01	5.22	0.38	9.00	0.45	10.62	0.30	10.44	0.63	9.45	0.35	4.59	0.01
<b>Right Bank</b>		10.60	0.00	12.30	0.00	12.20	0.00	9.00	0.00	3.00	0.00	5.80	0.22	10.00	0.30	11.80	0.00	11.60	0.33	10.51	0.00	5.16	0.00
<b>Feature Type</b> (riffle, run, or pool)		Pool		Pool		Run		Riffle		Riffle		Run		Pool		Run		Pool		Run		Riffle	

**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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 10:15	Site Location Description (e.g., road crossing): Ware Rd.
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

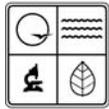
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0468365	Northing (UTM Y): 4268335	Horizontal Accuracy: (EPE / FOM / PDOP) 28 feet
Site 11	Easting (UTM X): 0468468	Northing (UTM Y): 4268464	Horizontal Accuracy: (EPE / FOM / PDOP) 21 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0089	upstream	101_0090	downstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

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

<input checked="" 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
Comments / Other:				

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

40% Cobble	45% Gravel	5% Sand	% Silt	5% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Water primrose Grasses
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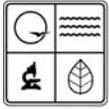
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Other: tannins
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.

WBID # 0865

Site # 4



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

 <p>Waterbody ID: <u>865</u> Site #: <u>4</u></p> <p>Estimated Channel Incision: <u>3.0</u> (m) (height between low bank width and water)</p> <p>GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)</p> <p><b>01</b> UTM X: <u>0468365</u> UTM Y: <u>4268335</u> +/- <u>28</u> (feet)</p> <p><b>11</b> UTM X: <u>0468468</u> UTM Y: <u>4268464</u> +/- <u>21</u> (feet)</p> <p>Average Stream Width: <u>10.0</u> (meters) Length of Survey Segment: <u>200</u> (meters) (To determine Length of Reach) (20x average stream width)</p> <p>Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u></p>	<p style="text-align: center;"><b>Dissolved Oxygen</b></p> <p>Date: <u>9/15/2007</u> Time: <u>10:15</u></p> <p>Dissolved Oxygen: <u>5.47</u> (mg/L)</p> <p>Dissolved Oxygen: <u>54.0</u> (% sat)</p> <p>Specific Cond: <u>270.9</u> (µS/cm)</p> <p>Water Temperature: <u>15.9</u> (°C)</p>
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		1.42	0.37	1.51	0.35	0.26	0.01	0.30	0.07	0.95	0.18	1.30	0.31	1.36	0.21	1.20	0.30	1.00	0.17	1.08	0.18	0.95	0.28
2		2.84	0.41	3.02	0.39	0.52	0.03	0.60	0.12	1.90	0.12	2.60	0.36	2.72	0.29	2.40	0.39	2.00	0.21	2.16	0.24	1.90	0.31
3		4.26	0.40	4.53	0.38	0.78	0.05	0.90	0.06	2.85	0.13	3.90	0.42	4.08	0.40	3.60	0.49	3.00	0.28	3.24	0.15	2.85	0.25
4		5.68	0.51	6.04	0.41	1.04	0.07	1.20	0.15	3.80	0.13	5.20	0.35	5.44	0.55	4.80	0.37	4.00	0.35	4.32	0.16	3.80	0.23
5		7.10	0.48	7.55	0.40	1.30	0.05	1.50	0.07	4.75	0.15	6.50	0.35	6.80	0.60	6.00	0.46	5.00	0.32	5.40	0.15	4.75	0.15
6		8.52	0.50	9.06	0.40	1.56	0.03	1.80	0.08	5.70	0.16	7.80	0.44	8.16	0.65	7.20	0.24	6.00	0.25	6.48	0.19	5.70	0.18
7		9.94	0.52	10.57	0.46	1.82	0.02	2.10	0.08	6.65	0.16	9.10	0.32	9.52	0.52	8.40	0.21	7.00	0.20	7.56	0.20	6.65	0.18
8		11.36	0.47	12.08	0.42	2.08	0.06	2.40	0.06	7.60	0.16	10.40	0.33	10.88	0.50	9.60	0.10	8.00	0.12	8.64	0.21	7.60	0.14
9		12.78	0.40	13.59	0.45	2.34	0.05	2.70	0.01	8.55	0.18	11.70	0.25	12.24	0.32	10.80	0.10	9.00	0.08	9.72	0.23	8.55	0.11
<b>Right Bank</b>		14.21	0.00	15.10	0.00	2.60	0.00	3.00	0.00	9.50	0.00	13.00	0.00	13.60	0.00	12.00	0.00	10.00	0.00	10.80	0.00	9.50	0.00
<b>Feature Type</b>		Run		Run		Riffle		Riffle		Run		Run		Pool		Run		Run		Run		Run	
(riffle, run, or pool)		Run		Run		Riffle		Riffle		Run		Run		Pool		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

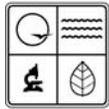
GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

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 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 11:00	Site Location Description (e.g., road crossing): 100m downstream of site 04, transect 11
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

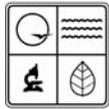
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0468551	Northing (UTM Y): 4268501	Horizontal Accuracy: (EPE / FOM / PDOP) 21 feet
Site 11	Easting (UTM X): 0468680	Northing (UTM Y): 4268616	Horizontal Accuracy: (EPE / FOM / PDOP) 26 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0091	upstream	101_0092	downstream	101_0093	Field road
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

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

<input checked="" 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
Comments / Other:				

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

50% Cobble	50% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Water primrose Grasses
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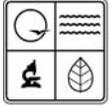
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Other: tannins
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input 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 effect another use.

WBID # 0865

Site # 5



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

<p>Waterbody ID: <u>865</u> Site #: <u>5</u></p> <p>Estimated Channel Incision: <u>3.0</u> (m) (height between low bank width and water)</p> <p>GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>01</b></td> <td style="width: 15%;">UTM X: <u>0468551</u></td> <td style="width: 15%;">UTM Y: <u>4268501</u></td> <td style="width: 10%;">+/- <u>21</u></td> <td style="width: 15%;">(feet)</td> </tr> <tr> <td><b>11</b></td> <td>UTM X: <u>0468680</u></td> <td>UTM Y: <u>4268616</u></td> <td>+/- <u>26</u></td> <td>(feet)</td> </tr> </table> <p>Average Stream Width: <u>10.0</u> (meters) Length of Survey Segment: <u>200</u> (meters)          (To determine Length of Reach) (20x average stream width)</p> <p>Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u></p>	<b>01</b>	UTM X: <u>0468551</u>	UTM Y: <u>4268501</u>	+/- <u>21</u>	(feet)	<b>11</b>	UTM X: <u>0468680</u>	UTM Y: <u>4268616</u>	+/- <u>26</u>	(feet)	<p style="text-align: center;"><b>Dissolved Oxygen</b></p> <p>Date: <u>9/15/2007</u> Time: <u>11:00</u></p> <p>Dissolved Oxygen: <u>6.41</u> (mg/L)</p> <p>Dissolved Oxygen: <u>62.8</u> (% sat)</p> <p>Specific Cond: <u>224.5</u> (µS/cm)</p> <p>Water Temperature: <u>15.5</u> (°C)</p>
<b>01</b>	UTM X: <u>0468551</u>	UTM Y: <u>4268501</u>	+/- <u>21</u>	(feet)							
<b>11</b>	UTM X: <u>0468680</u>	UTM Y: <u>4268616</u>	+/- <u>26</u>	(feet)							

#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>1</b>	1.01	0.35	1.00	0.15	1.12	0.41	1.21	0.14	0.26	0.09	0.37	0.10	1.33	0.35	1.12	0.35	1.35	0.30	0.93	0.14	0.50	0.01
	<b>2</b>	2.02	0.50	2.00	0.36	2.24	0.46	2.42	0.15	0.52	0.12	0.74	0.04	2.66	0.50	2.24	0.52	2.70	0.36	1.86	0.21	1.00	0.01
	<b>3</b>	3.03	0.64	3.00	0.43	3.36	0.50	3.63	0.15	0.78	0.14	1.11	0.06	3.99	0.51	3.36	0.46	4.05	0.38	2.79	0.25	1.50	0.01
	<b>4</b>	4.04	0.62	4.00	0.48	4.48	0.64	4.84	0.18	1.04	0.18	1.48	0.02	5.32	0.62	4.48	0.57	5.40	0.29	3.72	0.39	2.00	0.01
	<b>5</b>	5.05	0.48	5.00	0.55	5.60	0.54	6.05	0.20	1.30	0.20	1.85	0.01	6.65	0.65	5.60	0.65	6.75	0.24	4.65	0.51	2.50	0.03
	<b>6</b>	6.06	0.45	6.00	0.40	6.72	0.36	7.26	0.30	1.56	0.15	2.22	0.05	7.98	0.70	6.72	0.63	8.10	0.14	5.58	0.67	3.00	0.05
	<b>7</b>	7.07	0.37	7.00	0.50	7.84	0.20	8.47	0.29	1.82	0.17	2.59	0.04	9.31	0.67	7.84	0.50	9.45	0.13	6.51	0.70	3.50	0.04
	<b>8</b>	8.08	0.29	8.00	0.44	8.96	0.12	9.68	0.28	2.08	0.16	2.96	0.01	10.64	0.40	8.96	0.20	10.80	0.15	7.44	0.70	4.00	0.02
	<b>9</b>	9.09	0.12	9.00	0.27	10.08	0.07	10.89	0.19	2.34	0.08	3.33	0.02	11.97	0.36	10.08	0.17	12.15	0.16	8.37	0.48	4.50	0.01
<b>Right Bank</b>		10.10	0.00	10.00	0.00	11.20	0.00	12.12	0.00	2.65	0.00	3.75	0.00	13.31	0.00	11.22	0.00	13.51	0.00	9.35	0.00	5.05	0.00
<b>Feature Type</b>		Run		Run		Pool		Run		Run		Riffle		Pool		Run		Run		Pool		Riffle	

**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

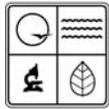
GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

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 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 12:40	Site Location Description (e.g., road crossing): Hwy E Bridge
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: clear	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

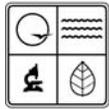
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0470894	Northing (UTM Y): 4270865	Horizontal Accuracy: (EPE / FOM / PDOP) 19 feet
Site 11	Easting (UTM X): 0471054	Northing (UTM Y): 4270997	Horizontal Accuracy: (EPE / FOM / PDOP) 22 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0094	upstream	101_0095	downstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

**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
Comments / Other: none				

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

60% Cobble	40% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Water primrose Filamentous algae
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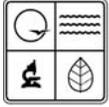
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Other: tannins
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input 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 effect another use.

WBID # 0865

Site # 6



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

 <p> <b>Missouri Department of Natural Resources</b>                  Waterbody ID: <u>865</u> Site #: <u>6</u>                  Estimated Channel Incision: <u>4.0</u> (m) (height between low bank width and water)             </p> <p>                 GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)             </p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>01</b></td> <td style="width: 15%;">UTM X: <u>0470894</u></td> <td style="width: 15%;">UTM Y: <u>4270865</u></td> <td style="width: 10%;">+/- <u>19</u></td> <td style="width: 15%;">(feet)</td> </tr> <tr> <td><b>11</b></td> <td>UTM X: <u>0471054</u></td> <td>UTM Y: <u>4270997</u></td> <td>+/- <u>22</u></td> <td>(feet)</td> </tr> </table> <p>                 Average Stream Width: <u>9.5</u> (meters) Length of Survey Segment: <u>200</u> (meters)                  (To determine Length of Reach) (20x average stream width)             </p> <p>                 Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u> </p>	<b>01</b>	UTM X: <u>0470894</u>	UTM Y: <u>4270865</u>	+/- <u>19</u>	(feet)	<b>11</b>	UTM X: <u>0471054</u>	UTM Y: <u>4270997</u>	+/- <u>22</u>	(feet)	<p style="text-align: center;"><b>Dissolved Oxygen</b></p> <p>Date: <u>9/15/2007</u> Time: <u>12:40</u></p> <p>Dissolved Oxygen: <u>8.10</u> (mg/L)</p> <p>Dissolved Oxygen: <u>84.3</u> (% sat)</p> <p>Specific Cond: <u>218.1</u> (µS/cm)</p> <p>Water Temperature: <u>16.1</u> (°C)</p>
<b>01</b>	UTM X: <u>0470894</u>	UTM Y: <u>4270865</u>	+/- <u>19</u>	(feet)							
<b>11</b>	UTM X: <u>0471054</u>	UTM Y: <u>4270997</u>	+/- <u>22</u>	(feet)							

#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>1</b>	1.05	0.14	1.04	0.17	1.46	0.15	1.39	0.11	1.47	0.25	0.80	0.07	0.82	0.12	0.70	0.12	0.26	0.02	1.00	0.14	0.80	0.05
	<b>2</b>	2.10	0.27	2.08	0.26	2.92	0.23	2.78	0.37	2.94	0.46	1.60	0.21	1.64	0.21	1.40	0.14	0.52	0.05	2.00	0.18	1.60	0.10
	<b>3</b>	3.15	0.38	3.12	0.32	4.38	0.33	4.17	0.51	4.41	0.55	2.40	0.28	2.46	0.28	2.10	0.11	0.78	0.06	3.00	0.26	2.40	0.13
	<b>4</b>	4.20	0.45	4.16	0.47	5.84	0.45	5.56	0.79	5.88	0.65	3.20	0.32	3.28	0.39	2.80	0.08	1.04	0.08	4.00	0.33	3.20	0.14
	<b>5</b>	5.25	0.39	5.20	0.50	7.30	0.58	6.95	0.78	7.35	0.88	4.00	0.41	4.10	0.46	3.50	0.04	1.30	0.08	5.00	0.42	4.00	0.22
	<b>6</b>	6.30	0.38	6.24	0.59	8.76	0.63	8.34	0.77	8.82	0.96	4.80	0.48	4.92	0.45	4.20	0.07	1.56	0.10	6.00	0.43	4.80	0.28
	<b>7</b>	7.35	0.29	7.28	0.56	10.22	0.55	9.73	0.72	10.29	>1	5.60	0.50	5.74	0.37	4.90	0.13	1.82	0.10	7.00	0.46	5.60	0.27
	<b>8</b>	8.40	0.24	8.32	0.45	11.68	0.58	11.12	0.68	11.76	>1	6.40	0.40	6.56	0.29	5.60	0.15	2.08	0.03	8.00	0.55	6.40	0.23
	<b>9</b>	9.45	0.18	9.36	0.28	13.14	0.40	12.51	0.49	13.23	>1	7.20	0.25	7.38	0.10	6.30	0.20	2.34	0.01	9.00	0.52	7.20	0.16
<b>Right Bank</b>		10.50	0.00	10.48	0.00	14.61	0.00	13.92	0.00	14.76	0.50	8.00	0.00	8.22	0.00	7.05	0.00	2.66	0.00	10.00	0.20	8.07	0.00
<b>Feature Type</b>		Run		Run		Run		Pool		Pool		Run		Run		Run		Riffle		Run		Run	
<small>(riffle, run, or pool)</small>																							

**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

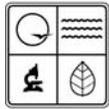
GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

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 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 13:13	Site Location Description (e.g., road crossing): 100m downstream of site 06, transect 11
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: sunny	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

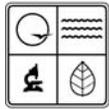
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0471035	Northing (UTM Y): 4271074	Horizontal Accuracy: (EPE / FOM / PDOP) 22 feet
Site 11	Easting (UTM X): 0471100	Northing (UTM Y): 4271306	Horizontal Accuracy: (EPE / FOM / PDOP) 18 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0096	upstream	101_0097	downstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

**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
Comments / Other: none				

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

30% Cobble	65% Gravel	% Sand	% Silt	5% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

grasses Water primrose Filamentous algae
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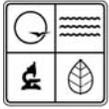
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.

WBID # 0865

Site # 7



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

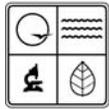
Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>7</u> Estimated Channel Incision: <u>4.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0471035</u> UTM Y: <u>4271074</u> +/- <u>22</u> (feet) <b>11</b> UTM X: <u>0471100</u> UTM Y: <u>4271306</u> +/- <u>18</u> (feet)  Average Stream Width: <u>10.0</u> (meters) Length of Survey Segment: <u>200</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<b>Dissolved Oxygen</b> Date: <u>9/15/2007</u> Time: <u>13:13</u>  Dissolved Oxygen: <u>6.28</u> (mg/L)  Dissolved Oxygen: <u>66.1</u> (% sat)  Specific Cond: <u>225.6</u> (µS/cm)  Water Temperature: <u>17.4</u> (°C)
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		0.60	0.20	1.16	0.11	1.10	0.13	1.22	0.10	1.03	0.30	0.60	0.15	0.59	0.15	1.05	0.16	1.12	0.37	1.80	0.20	0.60	0.28
2		1.20	0.31	2.32	0.14	2.20	0.20	2.44	0.20	2.06	0.39	1.20	0.26	1.18	0.28	2.10	0.37	2.24	0.45	3.60	0.40	1.20	0.31
3		1.80	0.31	3.48	0.17	3.30	0.35	3.66	0.39	3.09	0.51	1.80	0.37	1.77	0.40	3.15	0.45	3.36	0.51	5.40	0.51	1.80	0.36
4		2.40	0.36	4.64	0.20	4.40	0.46	4.88	0.60	4.12	0.50	2.40	0.50	2.36	0.44	4.20	0.60	4.48	0.63	7.20	0.60	2.40	0.34
5		3.00	0.40	5.80	0.20	5.50	0.50	6.10	0.64	5.15	0.55	3.00	0.56	2.95	0.43	5.25	0.64	5.60	0.74	9.00	0.58	3.00	0.37
6		3.60	0.40	6.96	0.30	6.60	0.61	7.32	0.80	6.18	0.56	3.60	0.51	3.54	0.45	6.30	0.61	6.72	0.80	10.80	0.62	3.60	0.29
7		4.20	0.28	8.12	0.38	7.70	0.65	8.54	0.80	7.21	0.50	4.20	0.50	4.13	0.30	7.35	0.58	7.84	0.71	12.60	0.78	4.20	0.18
8		4.80	0.16	9.28	0.34	8.80	0.48	9.76	0.71	8.24	0.37	4.80	0.32	4.72	0.21	8.40	0.50	8.96	0.62	14.40	0.68	4.80	0.10
9		5.40	0.10	10.44	0.25	9.90	0.52	10.98	0.60	9.27	0.28	5.40	0.18	5.31	0.04	9.45	0.30	10.08	0.45	16.20	0.83	5.40	0.04
<b>Right Bank</b>		6.00	0.00	11.60	0.00	11.00	0.00	12.27	0.00	10.31	0.00	6.07	0.00	5.97	0.00	10.52	0.00	11.27	0.00	18.08	0.30	6.00	0.00
<b>Feature Type</b> <small>(riffle, run, or pool)</small>		Run		Run		Pool		Pool		Run		Pool		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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/15/07 14:05	Site Location Description (e.g., road crossing): Morgan Rd.
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: sunny	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

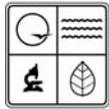
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0473637	Northing (UTM Y): 4275064	Horizontal Accuracy: (EPE / FOM / PDOP) 22 feet
Site 11	Easting (UTM X): 0473670	Northing (UTM Y): 4275255	Horizontal Accuracy: (EPE / FOM / PDOP) 23 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0098	upstream	101_0099	downstream	101_0100	Farm Road
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

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

<input checked="" 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
Comments / Other:				

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

30% Cobble	70% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Periphyton Forbs on gravel bars Water primrose Filamentous algae
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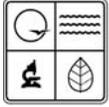
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.

WBID # 0865

Site # 8



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

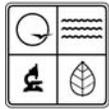
Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>8</u> Estimated Channel Incision: <u>3.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>4275064</u> UTM Y: <u>0473637</u> +/- <u>22</u> (feet) <b>11</b> UTM X: <u>4275255</u> UTM Y: <u>0473670</u> +/- <u>23</u> (feet)  Average Stream Width: <u>5.0</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<b>Dissolved Oxygen</b>
	Date: <u>9/15/2007</u> Time: <u>14:05</u>
	Dissolved Oxygen: <u>6.37</u> (mg/L)
	Dissolved Oxygen: <u>71.3</u> (% sat)
	Specific Cond: <u>245.6</u> (µS/cm)
	Water Temperature: <u>18.2</u> (°C)

#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		0.50	0.26	1.25	0.25	0.40	0.03	1.00	0.25	0.32	0.04	0.20	0.02	0.20	0.06	0.56	0.14	0.34	0.10	0.23	0.01	0.42	0.11
2		1.00	0.31	2.50	0.24	0.80	0.04	2.00	0.28	0.64	0.01	0.40	0.07	0.40	0.08	1.12	0.19	0.68	0.15	0.46	0.02	0.84	0.18
3		1.50	0.20	3.75	0.34	1.20	0.01	3.00	0.30	0.96	0.15	0.60	0.01	0.60	0.10	1.68	0.20	1.02	0.20	0.69	0.07	1.26	0.21
4		2.00	0.15	5.00	0.31	1.60	<0.01	4.00	0.33	1.28	0.18	0.80	0.10	0.80	0.13	2.24	0.18	1.36	0.21	0.92	0.06	1.68	0.20
5		2.50	0.13	6.25	0.33	2.00	0.01	5.00	0.27	1.60	0.15	1.00	0.04	1.00	0.14	2.80	0.15	1.70	0.20	1.15	0.03	2.10	0.15
6		3.00	0.14	7.50	0.35	2.40	0.03	6.00	0.18	1.92	0.12	1.20	0.05	1.20	0.11	3.36	0.19	2.04	0.18	1.38	0.01	2.52	0.11
7		3.50	0.20	8.75	0.45	2.80	0.05	7.00	0.10	2.24	0.10	1.40	0.03	1.40	0.05	3.92	0.12	2.38	0.11	1.61	0.04	2.94	0.10
8		4.00	0.18	10.00	0.32	3.20	0.03	8.00	0.08	2.56	0.07	1.60	0.02	1.60	0.03	4.48	0.13	2.72	0.06	1.84	0.04	3.36	0.04
9		4.50	0.10	11.25	0.21	3.60	0.02	9.00	0.04	2.88	0.03	1.80	0.01	1.80	0.01	5.04	0.10	3.06	0.02	2.07	0.02	3.78	0.03
<b>Right Bank</b>		5.00	0.00	12.50	0.00	4.00	0.00	10.05	0.00	3.27	0.00	2.08	0.00	2.09	0.00	5.61	0.00	3.49	0.00	2.30	0.00	4.26	0.00
<b>Feature Type</b>		Run		Run		Riffle		Run		Run		Riffle		Run		Run		Run		Riffle		Run	
(riffle, run, or pool)																							

**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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/16/07 7:30	Site Location Description (e.g., road crossing): Hwy 65 Bridge
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: sunny	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

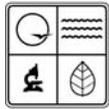
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)					
Site 01	Easting (UTM X): 0477922	Northing (UTM Y): 4279111	Horizontal Accuracy: (EPE / FOM / PDOP)		16 feet
Site 11	Easting (UTM X): 0478063	Northing (UTM Y): 4278956	Horizontal Accuracy: (EPE / FOM / PDOP)		16 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0101	upstream	101_0102	downstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

**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
Comments / Other: none				

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

% Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
----------	----------	--------	--------	------------	-----------

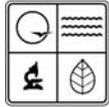
**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Water primrose
----------------

**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 type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other: brown
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.)

Transect 01 accessed by concrete drainage.  
 All other transects: banks too steep and water too deep to enter stream safely – it is our opinion that depths are > 1m.

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

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-15-07

Organization: AE Solutions

Position: Field Tech

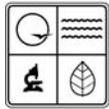
## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

<b>Missouri Department of Natural Resources</b> Waterbody ID: <u>865</u> Site #: <u>9</u> Estimated Channel Incision: <u>5.0</u> (m) (height between low bank width and water)																<b>Dissolved Oxygen</b>						
GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0477922</u> UTM Y: <u>4279111</u> +/- <u>16</u> (feet) <b>11</b> UTM X: <u>0478063</u> UTM Y: <u>4278956</u> +/- <u>16</u> (feet)																Date: <u>9/15/2007</u> Time: <u>7:30</u>						
Average Stream Width: <u>20.0</u> (meters) Length of Survey Segment: <u>300</u> (meters) (To determine Length of Reach) (20x average stream width)																Dissolved Oxygen: <u>6.16</u> (mg/L) Dissolved Oxygen: <u>65.6</u> (% sat) Specific Cond: <u>261.1</u> (µS/cm) Water Temperature: <u>19.3</u> (°C)						
Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>																Transect:						
Transect Cross-Section																						
01		02		03		04		05		06		07		08		09		10		11		
Station	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)														
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1.82	0.35	2.00	---	2.00	---	2.20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	3.64	0.77	4.00	---	4.00	---	4.40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	5.46	>1	6.00	---	6.00	---	6.60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	7.28	>1	8.00	---	8.00	---	8.80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	9.10	>1	10.00	---	10.00	---	11.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6	10.92	>1	12.00	---	12.00	---	13.20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7	12.74	>1	14.00	---	14.00	---	15.40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8	14.56	0.81	16.00	---	16.00	---	17.60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9	16.38	0.42	18.00	---	18.00	---	19.80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>Right Bank</b>	18.26	0.00	20.00	0.00	20.00	0.00	22.00	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00
Feature Type	Pool		Pool		Pool		Pool															
(riffle, run, or pool)	Pool		Pool		Pool		Pool															

**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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/16/07 08:05	Site Location Description (e.g., road crossing): S. Grand Ave.
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

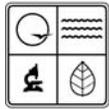
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0479060	Northing (UTM Y): 4278650	Horizontal Accuracy: (EPE / FOM / PDOP) 19 feet
Site 11	Easting (UTM X): 0479339	Northing (UTM Y): 4278673	Horizontal Accuracy: (EPE / FOM / PDOP) 20 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0103	upstream	101_0104	downstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

**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
Comments / Other: none				

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

% Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

none
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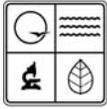
**Water Characteristics\*:** (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other: brown
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.

WBID # 0865

Site # 10



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.)

Stream banks too steep to safely enter stream – our opinion that depths are > 1 m.  
Transect 01 taken from bridge.  
DO measurements taken from bridge.

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

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-16-07

Organization: AE Solutions

Position: Field Tech

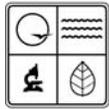
## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

<b>Missouri Department of Natural Resources</b> Waterbody ID: <u>865</u> Site #: <u>10</u> Estimated Channel Incision: <u>6.0</u> (m) (height between low bank width and water)																<b>Dissolved Oxygen</b>						
GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0479060</u> UTM Y: <u>4278650</u> +/- <u>19</u> (feet) <b>11</b> UTM X: <u>0479339</u> UTM Y: <u>4278673</u> +/- <u>20</u> (feet)																Date: <u>9/16/2007</u> Time: <u>8:05</u>						
Average Stream Width: <u>20.0</u> (meters) Length of Survey Segment: <u>300</u> (meters) (To determine Length of Reach) (20x average stream width)																Dissolved Oxygen: <u>4.69</u> (mg/L) Dissolved Oxygen: <u>50.8</u> (% sat) Specific Cond: <u>286.9</u> (µS/cm) Water Temperature: <u>19.0</u> (°C)						
Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>																Too steep						
Transect Cross-Section																						
01		02		03		04		05		06		07		08		09		10		11		
Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	3.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2	6.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3	9.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
4	12.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
5	15.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
6	18.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7	21.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
8	24.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
9	27.00	>1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
<b>Right Bank</b>	30.00	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00	---	0.00
<b>Feature Type</b> <small>(riffle, run, or pool)</small>	Pool		Pool		Pool																	

**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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/16/07 08:35	Site Location Description (e.g., road crossing): Hwy. U
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

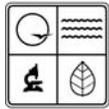
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0480921	Northing (UTM Y): 4279545	Horizontal Accuracy: (EPE / FOM / PDOP) 20 feet
Site 11	Easting (UTM X): 0481087	Northing (UTM Y): 4279490	Horizontal Accuracy: (EPE / FOM / PDOP) 30 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0105	upstream	101_0106	downstream	101_0107	Downstream T 10- fence
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0108	Downstream transect 10- livestock watering				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

**Uses Observed\*:** (Uses actually observed at 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 checked="" type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

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

<input checked="" 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 checked="" type="checkbox"/> Livestock Watering
Comments / Other:				

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

5% Cobble	90% Gravel	5% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Willow
Grasses
Coontail
Water primrose
Filamentous algae
sedges

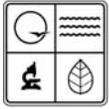
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Other: tannins
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input 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 effect another use.

WBID # 0865

Site # 11



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-16-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

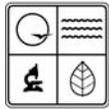
Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>11</u> Estimated Channel Incision: <u>4.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0480921</u> UTM Y: <u>4279545</u> +/- <u>20</u> (feet) <b>11</b> UTM X: <u>0481087</u> UTM Y: <u>4279490</u> +/- <u>30</u> (feet)  Average Stream Width: <u>9.0</u> (meters) Length of Survey Segment: <u>180</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>9/16/2007</u> Time: <u>8:35</u>  Dissolved Oxygen: <u>4.85</u> (mg/L)  Dissolved Oxygen: <u>52.8</u> (% sat)  Specific Cond: <u>304.5</u> (µS/cm)  Water Temperature: <u>19.4</u> (°C)
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station	Distance (m)	Depth (m)																					
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	2.80	0.80	0.43	0.10	0.50	0.08	0.92	0.26	0.50	0.15	0.30	0.10	0.48	0.01	0.45	0.20	0.95	0.18	1.02	0.10	1.30	0.25	
2	5.60	>1	0.86	0.15	1.00	0.16	1.84	0.45	1.00	0.17	0.60	0.13	0.96	0.05	0.90	0.51	1.90	0.35	2.04	0.29	2.60	0.41	
3	8.40	>1	1.29	0.11	1.50	0.13	2.76	0.46	1.50	0.15	0.90	0.22	1.44	0.11	1.35	0.46	2.85	0.38	3.06	0.47	3.90	0.48	
4	11.20	>1	1.72	0.13	2.00	0.11	3.68	0.37	2.00	0.16	1.20	0.26	1.92	0.13	1.80	0.52	3.80	0.40	4.08	0.57	5.20	0.53	
5	14.00	>1	2.15	0.15	2.50	0.17	4.60	0.25	2.50	0.14	1.50	0.18	2.40	0.18	2.25	0.53	4.75	0.41	5.10	0.65	6.50	0.52	
6	16.80	>1	2.58	0.05	3.00	0.16	5.52	0.12	3.00	0.10	1.80	0.12	2.88	0.09	2.70	0.48	5.70	0.41	6.12	0.58	7.80	0.51	
7	19.60	>1	3.01	0.10	3.50	0.10	6.44	0.18	3.50	0.03	2.10	0.10	3.36	0.03	3.15	0.31	6.65	0.37	7.14	0.48	9.10	0.52	
8	22.40	>1	3.44	0.08	4.00	0.13	7.36	0.01	4.00	0.00	2.40	0.07	3.84	0.02	3.60	0.24	7.60	0.28	8.16	0.25	10.40	0.41	
9	25.20	0.76	3.87	0.03	4.50	0.04	8.28	0.05	4.50	0.01	2.70	0.02	4.32	0.02	4.05	0.15	8.55	0.19	9.18	0.15	11.70	0.19	
<b>Right Bank</b>	28.00	0.00	4.31	0.00	5.00	0.00	9.26	0.00	5.00	0.00	3.09	0.00	4.80	0.00	4.54	0.00	9.51	0.00	10.22	0.00	13.00	0.00	
Feature Type	Pool		Riffle		Riffle		Run		Run		Run		Riffle		Run		Run		Pool		Pool		

**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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/16/07 09:15	Site Location Description (e.g., road crossing): 100m downstream of site 11, transect 11
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

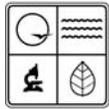
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 4279540	Northing (UTM Y): 0481193	Horizontal Accuracy: (EPE / FOM / PDOP) 16 feet
Site 11	Easting (UTM X): 4279716	Northing (UTM Y): 0481254	Horizontal Accuracy: (EPE / FOM / PDOP) 48 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0109	upstream	101_0110	downstream	101_0111	Livestock watering- Transect 1
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0112	Farm road- Transect 8				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

**Uses Observed\*:** (Uses actually observed at 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 checked="" type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

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

<input checked="" 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 checked="" type="checkbox"/> Livestock Watering
Comments / Other: Livestock watering at all transects.				

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

5% Cobble	95% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Coontail
Filamentous algae
Willow
Sedges
Arrowhead
duckweed

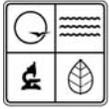
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.

WBID # 0865

Site # 12



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-16-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

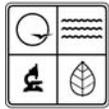
Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>12</u> Estimated Channel Incision: <u>4.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0481193</u> UTM Y: <u>4279540</u> +/- <u>16</u> (feet) <b>11</b> UTM X: <u>0481254</u> UTM Y: <u>4279716</u> +/- <u>48</u> (feet)  Average Stream Width: <u>8.0</u> (meters) Length of Survey Segment: <u>160</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>9/16/2007</u> Time: <u>9:15</u>  Dissolved Oxygen: <u>3.45</u> (mg/L)  Dissolved Oxygen: <u>37.0</u> (% sat)  Specific Cond: <u>303.2</u> (µS/cm)  Water Temperature: <u>19.1</u> (°C)
--	--

#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station	Distance (m)	Depth (m)																					
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	1.20	0.19	1.02	0.15	0.96	0.15	0.40	0.09	0.81	0.01	2.02	0.23	0.41	0.20	0.50	0.15	0.39	0.01	0.30	0.03	0.49	0.10	
2	2.40	0.35	2.04	0.30	1.92	0.20	0.80	0.09	1.62	0.13	4.04	0.25	0.82	0.20	1.00	0.20	0.78	0.03	0.60	0.09	0.98	0.15	
3	3.60	0.52	3.06	0.35	2.88	0.23	1.20	0.10	2.43	0.25	6.06	0.25	1.23	0.15	1.50	0.26	1.17	0.05	0.90	0.15	1.47	0.19	
4	4.80	0.70	4.08	0.35	3.84	0.25	1.60	0.11	3.24	0.30	8.08	0.25	1.64	0.15	2.00	0.30	1.56	0.15	1.20	0.18	1.96	0.21	
5	6.00	0.88	5.10	0.38	4.80	0.25	2.00	0.13	4.05	0.38	10.10	0.28	2.05	0.14	2.50	0.32	1.95	0.20	1.50	0.16	2.45	0.20	
6	7.20	0.80	6.12	0.25	5.76	0.30	2.40	0.15	4.86	0.37	12.12	0.38	2.46	0.05	3.00	0.33	2.34	0.23	1.80	0.25	2.94	0.18	
7	8.40	0.65	7.14	0.23	6.72	0.26	2.80	0.14	5.67	0.35	14.14	0.30	2.87	0.06	3.50	0.28	2.73	0.21	2.10	0.13	3.43	0.14	
8	9.60	0.45	8.16	0.25	7.68	0.10	3.20	0.10	6.48	0.30	16.16	0.31	3.28	0.04	4.00	0.15	3.12	0.26	2.40	0.10	3.92	0.10	
9	10.80	0.23	9.18	0.15	8.64	0.03	3.60	0.11	7.29	0.18	18.18	0.30	3.69	0.01	4.50	0.10	3.51	0.11	2.70	0.06	4.41	0.15	
<b>Right Bank</b>	12.00	0.00	10.21	0.00	9.67	0.00	4.00	0.00	8.19	0.00	20.26	0.00	4.12	0.00	5.00	0.00	3.97	0.00	3.01	0.00	4.96	0.00	
Feature Type	Pool		Run		Run		Riffle		Run		Run		Run		Pool		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 0.01 meter unless depth is too deep to measure (then record as > 1)  
 All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/16/07 10:05	Site Location Description (e.g., road crossing): Hwy. M
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: cloudy	Facility Name: Elm Hills Park
Weather Conditions for Past 10 days: rainy/clear	Permit Number: MO 0088382
Drought Conditions?: 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:**

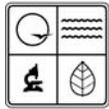
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0484321	Northing (UTM Y): 4279351	Horizontal Accuracy: (EPE / FOM / PDOP) 18 feet
Site 11	Easting (UTM X): 0484428	Northing (UTM Y): 4279457	Horizontal Accuracy: (EPE / FOM / PDOP) 18 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0113	downstream	101_0114	upstream		
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 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 <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Other:
Comments:				

**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 checked="" type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
Comments / Other: Fishing tackle hanging from power lines- fishing from bridge.				

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

10% Cobble	90% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Sedges
grasses
Coontail
Filamentous algae

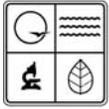
**Water Characteristics\*:** (Mark all that apply.)

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 checked="" type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other: murky
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input 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 effect another use.

WBID # 0865

Site # 13



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9-16-07

Organization: AE Solutions

Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Missouri Department of Natural Resources Waterbody ID: <u>865</u> Site #: <u>13</u> Estimated Channel Incision: <u>4.0</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>0484321</u> UTM Y: <u>4279351</u> +/- <u>18</u> (feet) <b>11</b> UTM X: <u>0484428</u> UTM Y: <u>4279457</u> +/- <u>18</u> (feet) Average Stream Width: <u>25.0</u> (meters) Length of Survey Segment: <u>300</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>9/16/2007</u> Time: <u>10:05</u> Dissolved Oxygen: <u>6.96</u> (mg/L) Dissolved Oxygen: <u>78.2</u> (% sat) Specific Cond: <u>306.6</u> (µS/cm) Water Temperature: <u>19.3</u> (°C)
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station	Distance (m)	Depth (m)																					
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	3.00	0.99	2.60	0.81	2.20	0.76	2.00	0.20	2.02	0.25	2.05	0.37	2.81	0.37	3.00	>1	3.02	>1	3.01	>1	2.17	0.31	
2	6.00	>1	5.20	>1	4.40	0.99	4.00	0.40	4.04	0.38	4.10	0.40	5.62	0.25	6.00	>1	6.04	>1	6.02	>1	4.34	0.58	
3	9.00	>1	7.80	>1	6.60	1.00	6.00	0.55	6.06	0.46	6.15	0.52	8.43	0.28	9.00	>1	9.06	>1	9.03	>1	6.51	0.62	
4	12.00	>1	10.40	>1	8.80	>1	8.00	0.65	8.08	0.47	8.20	0.55	11.24	0.22	12.00	0.50	12.08	0.89	12.04	>1	8.68	0.67	
5	15.00	>1	13.00	>1	11.00	>1	10.00	0.63	10.10	0.57	10.25	0.52	14.05	0.15	15.00	0.60	15.10	0.96	15.05	0.97	10.85	0.58	
6	18.00	>1	15.60	>1	13.20	>1	12.00	0.79	12.12	0.70	12.30	0.45	16.86	0.15	18.00	0.71	18.12	0.99	18.06	0.94	13.02	0.59	
7	21.00	>1	18.20	>1	15.40	>1	14.00	>1	14.14	0.65	14.35	0.44	19.67	0.36	21.00	0.83	21.14	0.97	21.07	0.99	15.19	0.42	
8	24.00	>1	20.80	>1	17.60	0.98	16.00	>1	16.16	0.68	16.40	0.32	22.48	0.47	24.00	>1	24.16	>1	24.08	>1	17.36	0.35	
9	27.00	>1	23.40	0.92	19.80	0.68	18.00	0.89	18.18	0.65	18.45	0.20	25.29	0.31	27.00	>1	27.18	>1	27.09	>1	19.53	0.22	
<b>Right Bank</b>	30.00	0.00	26.00	0.00	22.00	0.00	20.00	0.00	20.21	0.00	20.54	0.00	28.10	0.00	30.00	0.00	30.27	0.00	30.19	0.00	21.78	0.00	
<b>Feature Type</b> <small>(riffle, run, or pool)</small>	Pool		Pool		Pool		Run		Run		Run		Run		Pool		Pool		Pool		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 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

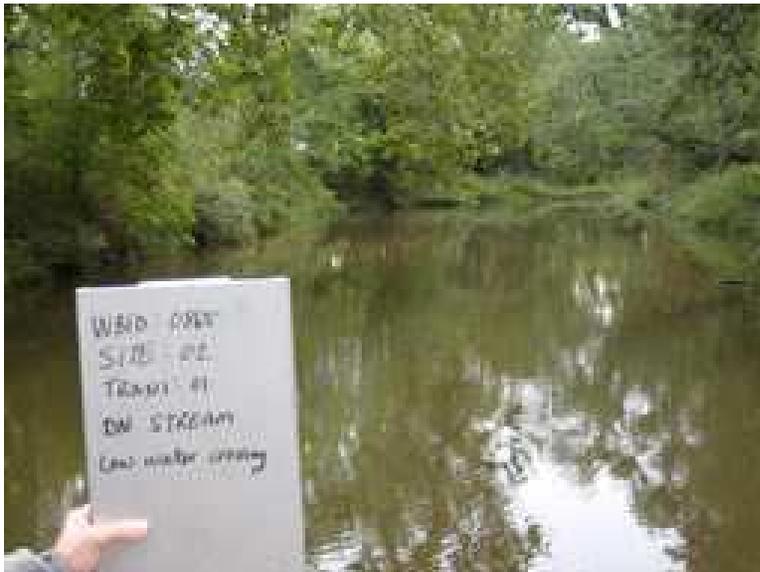
**WBID# 0865 Flat Creek**



**Site# 1 Downstream**



**Site# 1 Upstream**



**Site# 2 Downstream**

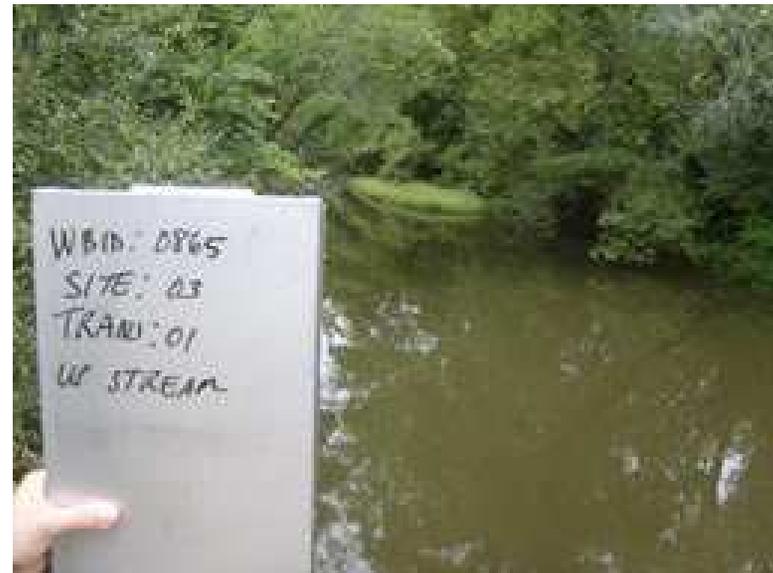


**Site# 2 Upstream**

**WBID# 0865 Flat Creek**



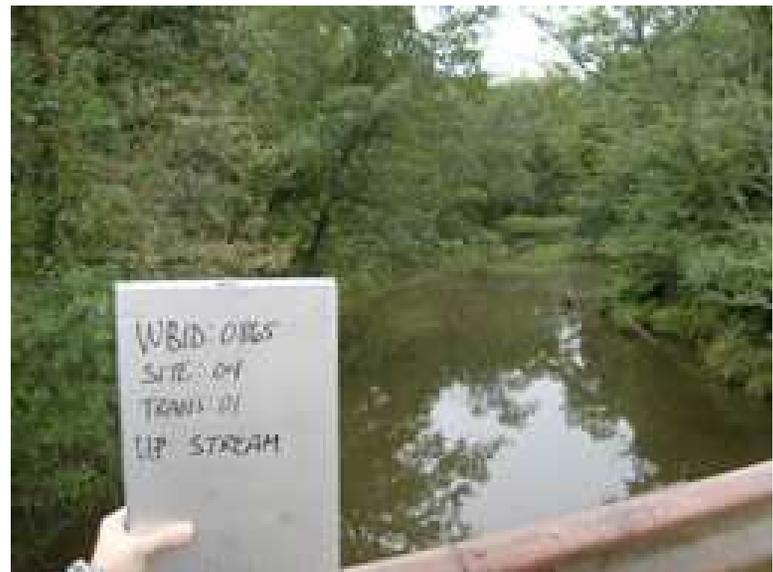
**Site# 3 Downstream**



**Site# 3 Upstream**



**Site# 3 T 2, Farm road**



**Site# 4 Upstream**

**WBID# 0865 Flat Creek**



**Site# 4 Downstream**



**Site# 5 T 2, Field road**



**Site# 5 Downstream**



**Site# 5 Upstream**

**WBID# 0865 Flat Creek**



**Site# 6 Downstream**



**Site# 6 Upstream**



**Site# 7 Downstream**

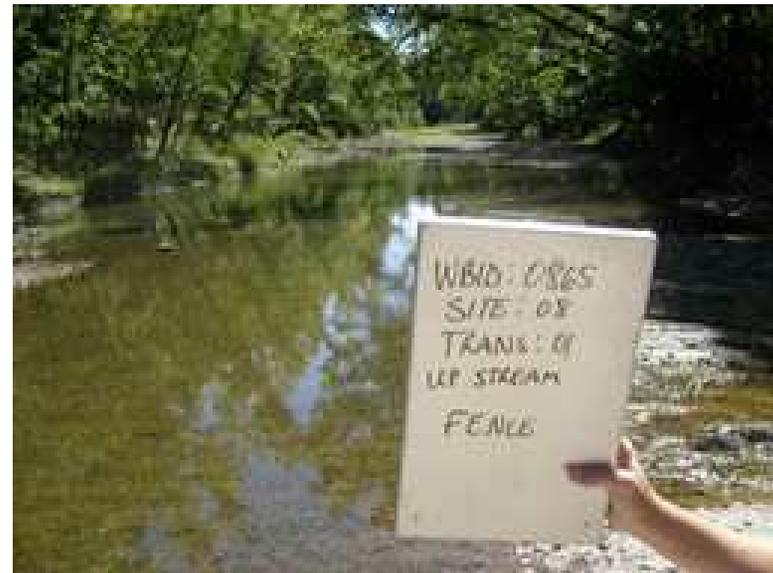


**Site# 7 Upstream**

**WBID# 0865 Flat Creek**



**Site# 8 Downstream**



**Site# 8 Upstream**



**Site# 8 T 7, Farm road**

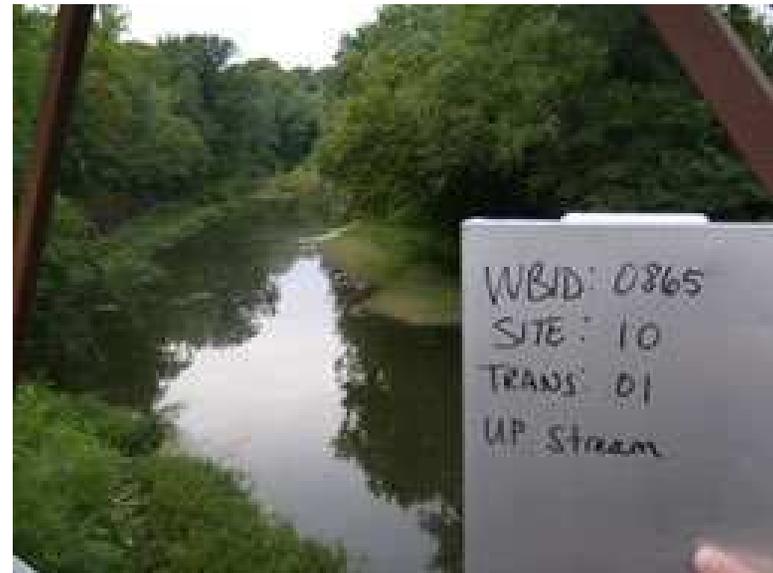


**Site# 9 Upstream**

**WBID# 0865 Flat Creek**



**Site# 9 Downstream**



**Site# 10 Upstream**

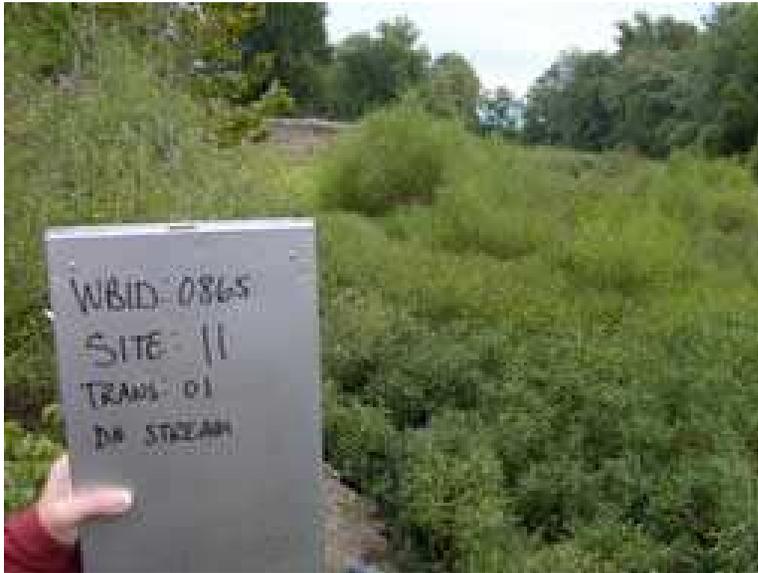


**Site# 10 Downstream**

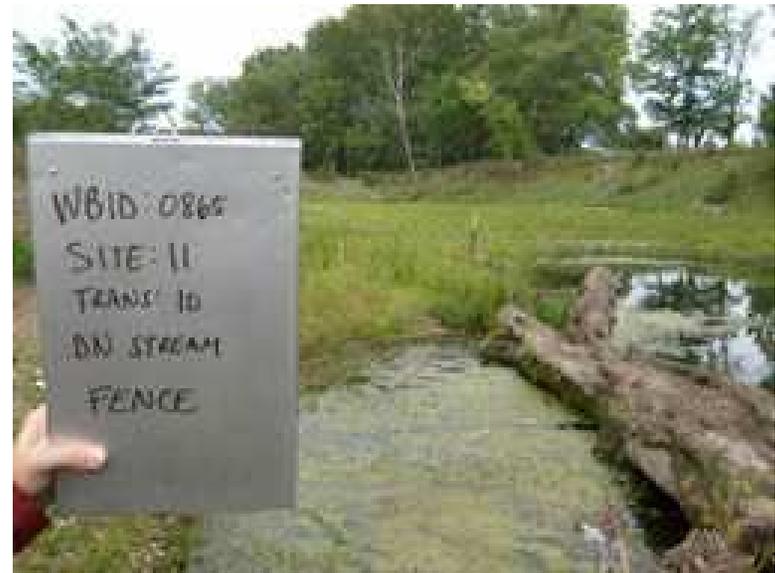


**Site# 11 Upstream**

**WBID# 0865 Flat Creek**



**Site# 11 Downstream**



**Site# 11 T 10, Fence**



**Site# 11 T 10 Livestock watering**



**Site# 12 Upstream**

**WBID# 0865 Flat Creek**



**Site# 12 Livestock watering**



**Site# 12 T 8, Farm road**



**Site# 12 Downstream**



**Site# 13 Upstream**

**WBID# 0865 Flat Creek**



**Site# 13 Downstream**