Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 1828 Indian Creek

Submitted by
MEC Water Resources

To
Missouri Department of Natural Resources
Water Protection Program

On
December 1, 2007

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):	Indian Cr.
Missouri Water Body Identification (WBID) Number:	1828
8-digit HUC: 20080109	County: Cape Girardeau
Upstream Legal Description (from Table H):	10, 32N, 13E
Downstream Legal Description(from Table H):	Mouth
Number of sites evaluated	4
List all sites numbers, listed consecutively upstream to downstream: site 1: County Rd. 607; site 2: 150 m dnstream of site 1; site 3: Hwy U Bridge; Site 4: Hwy 177 Bridge	

II. Discharger Facility Information (list all permitted dischargers on the stream)

Discharger Facility Name(s):	North Elementary School
Discharger Permit Number(s):	MO 0100757

III. UAA Surveyor (please print legibly)

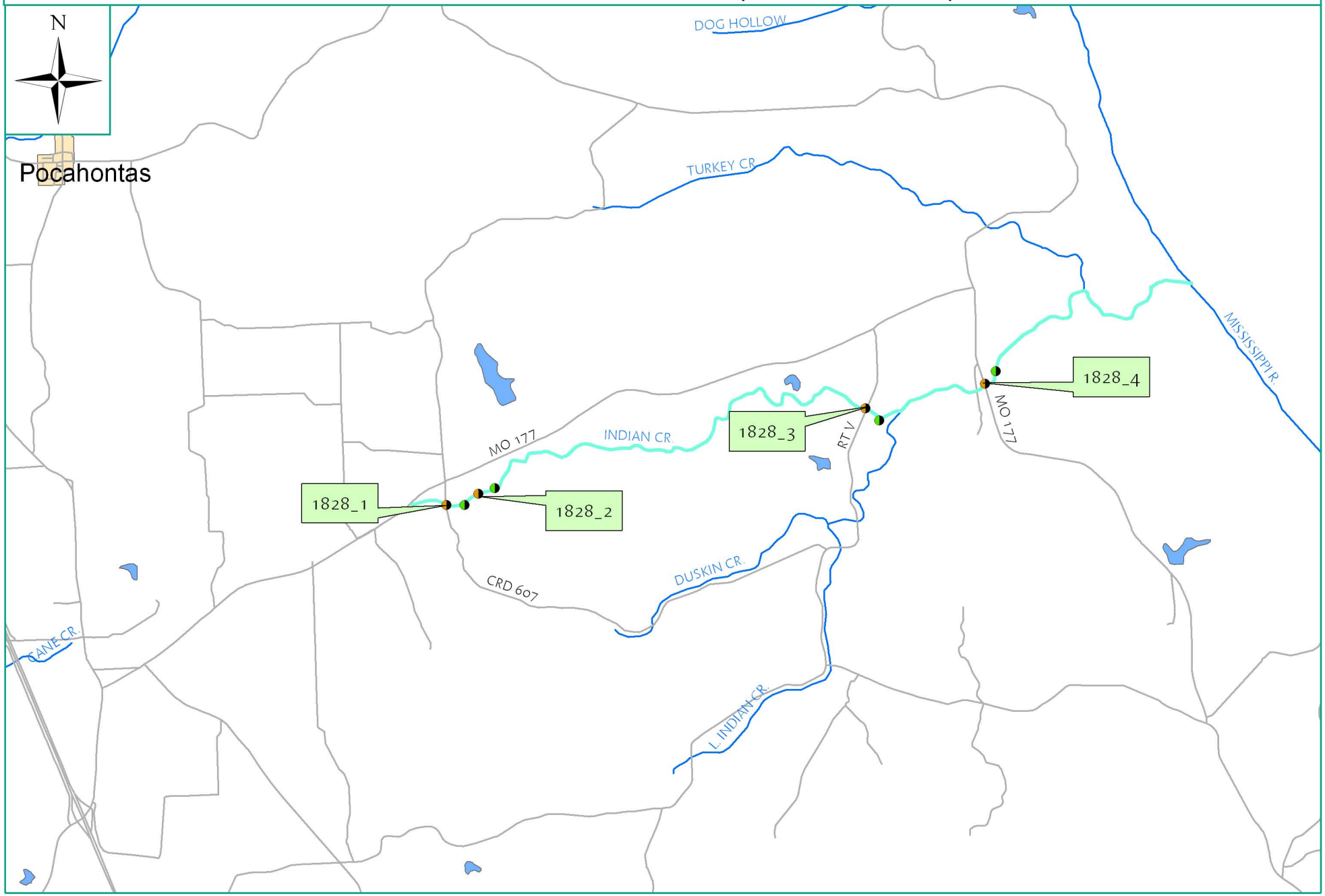
Name of Surveyor Renee Martin	Telephone Number: 573-875-7844
Organization/Employer: AE Solutions	
Position: Env. Specialist	

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

Signed: Renee Martin **Date:** 10/31/07

RMC 11-2-07

Trib. to Indian Cr. (WBID 1828)



Upstream Boundary

Downstream Boundary

0 0.5 1 2 3 4 Miles

WBID # 1828

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization

(must be completed for each site)

Date & Time: 10/30/07 0850	Site Location Description (e.g., road crossing): County Rd 607
Personnel (Data Collectors): RM/JH	
Current Weather Conditions: Clear	Facility Name: North Elementary School
Weather Conditions for Past 10 days: clear/rain	Permit Number: MO100757
Drought Conditions?: No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 414922	Northing (UTM Y): 271101	Horizontal Accuracy: (EPE / FOM / PDOP)	22 ~~Meters~~ ft
Site 11	Easting (UTM X): 414921	Northing (UTM Y): 271321	Horizontal Accuracy: (EPE / FOM / PDOP)	21 ~~Meters~~ ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1828-1-889 ~~886~~ RM	Upstream Site 1	1828-1-890 RM ~~887~~	DN Stream Site 1		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ Other:

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

WBID # 1828

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☒ Fence	☐ No trespass sign	☒ Steep slopes	☐ Other:
Comments:				

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
Comments / Other: None				

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

% Cobble	50 % Gravel	50 % Sand	% Silt	% Mud/Clay	% Bedrock

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

lots of smartweed w/in gravel bars.

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☒ Clear	☐ Green	☐ Gray	☐ Milky	☐ Other:
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☐ Other:
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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 # 1828

Site # 1

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.)

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

Surveyor's Signature: Renee Ment Date of Survey: 10/30/07

Organization: AE Solutions Position: Env. Specialist

RMC 11-2-07

Recreational Use Attainability Analysis Field Survey Sheet

Waterbody ID: 1828 Site #: 1828 - 1 (WBID_Site#)

Estimated Channel Incision: 3 (m) (height between low bank width and water)

GPS Location (taken at transect 1):
UTM X: 4149221 UTM Y: 271101
Horizontal Accuracy Estimate (GPS Data Quality): +/- 22 (feet)

GPS Location (taken at transect 11):
UTM X: 4149211 UTM Y: 271321
Horizontal Accuracy Estimate (GPS Data Quality): +/- 21 (feet)

Average Stream Width: 8.5 (meters) (To determne Length of Reach)

Length of Survey Segment: 190 (meters) (20x average stream width)

Field Staff: RM / JH

Dissolved Oxygen

Date: 10/30/07 Time: 0850

Dissolved Oxygen: 6.98 (mg/L)

Dissolved Oxygen: 60.7 (% sat)

Specific Cond: 348.8 (µS/cm)

Water Temp.: 9.1 (°C)

Transect Cross-Section

Station	01 Distance (m)	01 Depth (m)	02 Distance (m)	02 Depth (m)	03 Distance (m)	03 Depth (m)	04 Distance (m)	04 Depth (m)	05 Distance (m)	05 Depth (m)	06 Distance (m)	06 Depth (m)	07 Distance (m)	07 Depth (m)	08 Distance (m)	08 Depth (m)	09 Distance (m)	09 Depth (m)	10 Distance (m)	10 Depth (m)	11 Distance (m)	11 Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.53	0	0
1	0.65	0.08	1.20	0.43	1.35	0.14	0.39	0.10	1.25	0.04	0.54	0.08	0.53	0.05	0.96	0.05	0.62	0.05	0.83	0.54	0.96	0.08
2	1.30	0.15	2.40	0.50	2.70	0.15	0.78	0.10	2.50	0.04	1.08	0.15	1.06	0.09	1.92	0.01	1.74	0.15	1.66	0.46	1.92	0.15
3	1.95	0.32	3.60	0.29	4.05	0.12	1.17	0.14	3.75	0.03	1.62	0.20	1.59	0.15	2.88	<0.01	1.86	0.34	2.49	0.36	2.88	0.25
4	2.60	0.44	4.80	0.45	5.40	0.12	1.56	0.10	5.00	0.03	2.16	0.24	2.12	0.20	3.84	0.03	2.48	0.32	3.32	0.26	3.84	0.37
5	3.25	0.59	6.00	0.65	6.75	0.29	1.95	0.08	6.25	0.01	2.70	0.26	2.65	0.25	4.80	0.07	3.10	0.38	4.15	0.18	4.80	0.35
6	3.90	0.65	7.20	0.65	8.10	0.33	2.34	0.07	7.50	0.15	3.24	0.30	3.18	0.27	5.76	0.01	3.72	0.34	4.98	0.13	5.76	0.26
7	4.55	0.85	8.40	0.58	9.45	0.43	2.73	0.01	8.75	0.09	3.78	0.25	3.71	0.23	6.72	0.01	4.34	0.30	5.81	0.10	6.72	0.24
8	5.20	0.74	9.60	0.50	10.80	0.37	3.12	0.00	10.00	0.05	4.32	0.30	4.24	0.21	7.68	0.03	4.96	0.22	6.64	0.10	7.68	0.25
9	5.85	0.30	10.80	0.05	12.15	0.22	3.51	0.03	11.25	0.13	4.86	0.34	4.77	0.15	8.64	0.09	5.58	0.13	7.47	0.05	8.64	0.07
Right Bank	6.50	0.15	12.00	0	13.7	0	3.90	0	12.70	0	5.45	0	5.30	0	9.60	0	6.25	0	8.30	0	9.60	0
Feature Type (riffle, run, or pool)	Pool		Pool		Run		Run		Run		Run		Run		Riffle		Run		Run		Run	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0depth). This width is the wetted width
GPS location corresponds to Transect 01 and Transect 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: [signature] Date: 10/30/07

RMC 11-2-07

WBID # 1828

Site # 2

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization

(must be completed for each site)

Date & Time: 10/30/07 0925	Site Location Description (e.g., road crossing): 150m dNstream Site 1, Transect # 11
Personnel (Data Collectors): RM/JH	
Current Weather Conditions: Clear	Facility Name: north Elementary School
Weather Conditions for Past 10 days: clear / Rain	Permit Number: MO 0100757
Drought Conditions?: No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 449333	Northing (UTM Y): 271501	Horizontal Accuracy: (EPE / FOM / PDOP) 17	~~Meters~~ ft
Site 11	Easting (UTM X): 449388	Northing (UTM Y): 271702	Horizontal Accuracy: (EPE / FOM / PDOP) 26	~~Meters~~ ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1828-2-891 ~~888~~ RM	DN Stream Site 2	RM ~~889~~	1828-2- 892 Upstream Site 2		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ Other:

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

WBID # 1828

Site # 2

Field Data Sheets for Recreational Use Stream Surveys

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☒ Fence	☐ No trespass sign	☒ Steep slopes	☐ Other:

Comments:

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering

Comments / Other:

None

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

– % Cobble	45 % Gravel	45 % Sand	– % Silt	10 % Mud/Clay	– % Bedrock

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

Minor amt of smartweed on gravel bars

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☒ Clear	☐ Green	☐ Gray	☐ Milky	☐ Other:
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☒ Other: leafy debris
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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 # 1828

Site # 2

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.)

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

Surveyor's Signature: [signature] Date of Survey: 10/30/07

Organization: AE Solutions Position: Env. Specialist

RWC 11-2-07

Recreational Use Attainability Analysis Field Survey Sheet

Waterbody ID: 1828 Site #: 1828-2
(WBID_Site#)

Estimated Channel Incision: 3.0 (m) (height between low bank width and water)

GPS Location (taken at transect 1):
UTM X: 4149333 UTM Y: 271501
Horizontal Accuracy Estimate (GPS Data Quality): +/- 17 (feet)

GPS Location (taken at transect 11):
UTM X: 4149388 UTM Y: 271702
Horizontal Accuracy Estimate (GPS Data Quality): +/- 26 (feet)

Average Stream Width: 7.0 (meters) Length of Survey Segment: 150 (meters)
(To determne Length of Reach) (20x average stream width)

Field Staff: RW JH

Dissolved Oxygen

Date: 10/30/07 Time: 09:25

Dissolved Oxygen: 6.94 (mg/L)

Dissolved Oxygen: 60.7 (% sat)

Specific Cond: 340 (µS/cm)

Water Temp.: 9.7 (°C)

Transect Cross Section

Station	01 Distance (m)	01 Depth (m)	02 Distance (m)	02 Depth (m)	03 Distance (m)	03 Depth (m)	04 Distance (m)	04 Depth (m)	05 Distance (m)	05 Depth (m)	06 Distance (m)	06 Depth (m)	07 Distance (m)	07 Depth (m)	08 Distance (m)	08 Depth (m)	09 Distance (m)	09 Depth (m)	10 Distance (m)	10 Depth (m)	11 Distance (m)	11 Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1.16	0.26	0.59	0.30	0.64	0.19	0.97	0.04	1.47	0.02	0.66	0.05	0.82	0.15	0.25	<0.01	0.37	0.16	0.57	0.05	0.22	0.15
2	2.32	0.45	1.18	0.28	1.28	0.25	1.94	0.08	2.94	0.00	1.32	0.06	1.64	0.15	0.50	<0.01	0.74	0.27	1.14	0.11	0.44	0.14
3	3.48	0.57	1.77	0.19	1.92	0.20	2.91	0.10	4.41	0.00	1.98	0.04	2.46	0.16	0.75	0.01	1.11	0.14	1.71	0.18	0.66	0.06
4	4.64	0.63	2.36	0.15	2.56	0.26	3.88	0.08	5.88	0.00	2.64	0.01	3.28	0.14	1.00	0.03	1.48	0.19	2.28	0.23	0.88	0.03
5	5.80	0.54	2.95	0.13	3.20	0.25	4.85	0.05	7.35	0.00	3.30	0.01	4.10	0.13	1.25	0.06	1.85	0.18	2.85	0.25	1.10	0.01
6	6.96	0.38	3.54	0.13	3.84	0.20	5.82	0.06	8.82	0.00	3.96	0.01	4.92	0.08	1.50	0.09	2.22	0.05	3.42	0.35	1.32	0.01
7	8.12	0.45	4.13	0.11	4.48	0.14	6.79	0.05	10.29	0.00	4.62	0.04	5.74	0.05	1.75	0.08	2.59	0.01	3.99	0.55	1.54	0.02
8	9.28	0.46	4.72	0.10	5.12	0.08	7.76	0.10	11.76	0.08	5.28	0.02	6.56	0.10	2.00	0.08	2.96	0.03	4.56	0.69	1.76	0.03
9	10.44	0.20	5.31	0.08	5.76	<0.01	8.73	0.06	13.23	0.05	5.94	0.04	7.38	0.05	2.25	0.09	3.33	0.04	5.13	0.18	1.98	0.03
Right Bank	11.60	0	5.95	0	6.40	0	9.75	0	14.75	0	6.60	0	8.20	0	2.50	0	3.75	0	5.70	0	2.20	0
Feature Type (riffle, run, or pool)	POOL																					
	~~RUN~~		RUN		RUN		RUN		RIFFLE		RIFFLE		RUN		RIFFLE		RUN		POOL		RIFFLE	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0depth). This width is the wetted width
GPS location corresponds to Transect 01 and Transect 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.

RWC 11-2-07

Signed: [signature] Date: 10/30/07

WBID # 1828
Site # RM 4 3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization
(must be completed for each site)

Date & Time: 10/30/07 0800	Site Location Description (e.g., road crossing): Hwy ~~177~~ 14CH V road crossing
Personnel (Data Collectors): RM/JH	Facility Name: North Elementary School
Current Weather Conditions: Clear	Permit Number: MO 0100757
Weather Conditions for Past 10 days: clear/rain	
Drought Conditions?: No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 415007	Northing (UTM Y): 2 76273	Horizontal Accuracy: (EPE / FOM / PDOP) 14 ~~Meters~~ JCH ft
Site 11	Easting (UTM X): 4149915	Northing (UTM Y): 276430	Horizontal Accuracy: (EPE / FOM / PDOP) 16 ~~Meters~~ JCH ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1828-3-887	DN Stream	1828-3-888	up Stream		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ Other:

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

WBID # 1828
Site # 4-3
JRH

Field Data Sheets for Recreational Use Stream Surveys

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☒ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☒ Fence	☐ No trespass sign	☒ Steep slopes	☐ Other:
Comments:				

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
RM ☒ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
Comments / Other: ~~Gravel mining / scraping~~ RM None				

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

% Cobble	50 % Gravel	50 % Sand	% Silt	% Mud/Clay	% Bedrock

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

Minimal amt of smartweed w/in gravel bars.

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☒ Clear	☐ Green	☐ Gray	☐ Milky	☐ Other:
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☒ Other: leafy debris
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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 # 1828

Site # 3

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.)

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

Surveyor's Signature: [signature] Date of Survey: 10/30/07

Organization: AE Solutions Position: Env. Specialist

RWC 11-2-07

Recreational Use Attainability Analysis Field Survey Sheet

Waterbody ID: 1828 Site #: 1828-~~4~~ 3 RM
(WBID_Site#)

Estimated Channel Incision: 3.0 (m) (height between low bank width and water)

GPS Location (taken at transect 1):
UTM X: 4150074 UTM Y: 276273
Horizontal Accuracy Estimate (GPS Data Quality): +/- 14 (feet)

GPS Location (taken at transect 11):
UTM X: 4149915 UTM Y: 276430
Horizontal Accuracy Estimate (GPS Data Quality): +/- 16 (feet)

Average Stream Width: 8.0 (meters) Length of Survey Segment: 200 (meters)
(To determne Length of Reach) (20x average stream width)

Field Staff: RM / JH

Dissolved Oxygen

Date: 10/30/07 Time: 0800

Dissolved Oxygen: 7.69 (mg/L)

Dissolved Oxygen: 67.7 (% sat)

Specific Cond: 249.8 (µS/cm)

Water Temp.: 9.7 (°C)

Transect Cross Section

Station	01 Distance (m)	01 Depth (m)	02 Distance (m)	02 Depth (m)	03 Distance (m)	03 Depth (m)	04 Distance (m)	04 Depth (m)	05 Distance (m)	05 Depth (m)	06 Distance (m)	06 Depth (m)	07 Distance (m)	07 Depth (m)	08 Distance (m)	08 Depth (m)	09 Distance (m)	09 Depth (m)	10 Distance (m)	10 Depth (m)	11 Distance (m)	11 Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.94	0.21	1.00	0.20	1.00	0.11	0.38	0.08	0.97	0.07	0.52	0.10	0.72	0.27	1.02	0.05	0.68	0.18	0.55	0.03	0.50	0.15
2	1.68	0.37	2.00	0.29	2.00	0.18	0.76	0.09	1.94	0.15	1.04	0.14	1.44	0.34	2.04	0.20	1.36	0.25	1.10	0.11	1.00	0.24
3	2.52	0.45	3.00	0.44	3.00	0.24	1.14	0.09	2.91	0.20	1.56	0.15	2.16	0.44	3.06	0.31	2.04	0.26	1.65	0.14	1.50	0.27
4	3.36	0.56	4.00	0.55	4.00	0.15	1.52	0.06	3.88	0.33	2.08	0.14	2.88	0.44	4.08	0.54	2.72	0.34	2.20	0.40	2.00	0.07
5	4.20	0.72	5.00	0.67	5.00	0.10	1.90	0.11	4.85	0.43	2.60	0.15	3.60	0.47	5.10	0.80	3.40	0.42	2.75	0.60	2.50	0.11
6	5.04	0.80	6.00	0.75	6.00	0.03	2.28	0.11	5.82	0.45	3.12	0.16	4.32	0.53	6.12	>1.0	4.08	0.45	3.30	0.46	3.00	0.30
7	5.88	0.75	7.00	0.50	7.00	0.04	2.66	0.13	6.79	0.40	3.64	0.14	5.04	0.52	7.14	>1.0	4.76	0.36	3.85	0.33	3.50	0.50
8	6.72	0.45	8.00	0.54	8.00	0.02	3.04	0.11	7.76	0.50	4.16	0.14	5.76	0.39	8.16	0.78	5.44	0.27	4.40	0.03	4.00	0.80
9	7.56	0.15	9.00	0.20	9.00	0.08	3.42	0.12	8.73	0.34	4.68	0.08	6.48	0.20	9.18	0.40	6.12	0.21	4.95	0.10	4.50	0.67
Right Bank	8.40	0	10.00	0	10.00	0	3.85	0	9.75	0.14	~~6~~ 5.20 RM	0	7.20	0	10.25	0	6.80	0	5.50	0	5.00	0
Feature Type (riffle, run, or pool)	Pool		Pool		Riffle		Run		Pool		Run		Pool		Pool		Run		RM ~~Riffle~~ Pool		Run	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0depth). This width is the wetted width
GPS location corresponds to Transect 01 and Transect 11. Transects ordered in upstream to downstream order.
Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

RMC 11-2-07

Signed: [signature] Date: 10/30/07

WBID # 1828
Site # ~~3~~ 4 rm

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization

(must be completed for each site)

Date & Time: 10/30/07 0715	Site Location Description (e.g., road crossing): Hwy ~~V~~ 177 ~~JRH~~ road crossing
Personnel (Data Collectors): RMTJH	
Current Weather Conditions: Clear	Facility Name: north Elementary School
Weather Conditions for Past 10 days: Clear/rain	Permit Number: MO 0100757
Drought Conditions?: No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 4150279	Northing (UTM Y): 277741	Horizontal Accuracy: (EPE / FOM / PDOP) 28 ~~Meters~~ JRH ft
Site 11	Easting (UTM X): 4150421	Northing (UTM Y): 277884	Horizontal Accuracy: (EPE / FOM / PDOP) 22 ~~Meters~~ JRH ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1828-4- ~~884~~ 884 rm ~~7~~ JRH	Upstream Site 4	1828-4- ~~888~~ 885 ~~885~~ rm JRH	DN stream Site 4		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ Other:

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

WBID # 1828
Site # rm 3 4

Field Data Sheets for Recreational Use Stream Surveys

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☐ Rural Residential
☐ Campgrounds	☒ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☒ Fence	☐ No trespass sign	☒ Steep slopes	☐ Other:

Comments:

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering

Comments / Other:

None

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

% Cobble	50 % Gravel	50 % Sand	% Silt	% Mud/Clay	% Bedrock

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

little amt of benthic algae
Smartweed spp. w/ in gravel bar.

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☒ Clear	☐ Green	☐ Gray	☐ Milky	☐ Other:
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☒ Other: leafy debris
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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 # 1828

Site # 4

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.)

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

Surveyor's Signature: Renee Mart Date of Survey: 10/30/07

Organization: AE Solutions Position: Env. Specialist

RWC 11-2-07

Recreational Use Attainability Analysis Field Survey Sheet

Waterbody ID: 1828 Site #: 1828-34 RM
(WBID_Site#)

Estimated Channel Incision: 5.0 (m) (height between low bank width and water)

GPS Location (taken at transect 1):
UTM X: 4150279 UTM Y: 277741
Horizontal Accuracy Estimate (GPS Data Quality): +/- 28 (feet)

GPS Location (taken at transect 11):
UTM X: 4150421 UTM Y: 277884
Horizontal Accuracy Estimate (GPS Data Quality): +/- 22 (feet)

Average Stream Width: 9.5 (meters) Length of Survey Segment: 200 (meters)
(To determne Length of Reach) (20x average stream width)

Field Staff: RM/JH

Dissolved Oxygen

Date: 10/30/07 Time: 0715

Dissolved Oxygen: 7.49 (mg/L)

Dissolved Oxygen: 67.1 (% sat)

Specific Cond: 169.4 (µS/cm)

Water Temp.: 10.6 (°C)

Transect Cross-Section

Station	01 Distance (m)	01 Depth (m)	02 Distance (m)	02 Depth (m)	03 Distance (m)	03 Depth (m)	04 Distance (m)	04 Depth (m)	05 Distance (m)	05 Depth (m)	06 Distance (m)	06 Depth (m)	07 Distance (m)	07 Depth (m)	08 Distance (m)	08 Depth (m)	09 Distance (m)	09 Depth (m)	10 Distance (m)	10 Depth (m)	11 Distance (m)	11 Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.64	0.11	1.15	0.30	1.15	0.75	1.04	0.13	0.65	0.02	0.70	0.05	0.93	0.20	0.95	0.28	0.90	0.15	1.00	0.10	1.40	0.06
2	1.28	0.15	2.30	0.19	2.30	>1.0	2.08	0.25	1.30	0.03	1.40	0.16	1.80	0.40	1.90	0.53	1.80	0.34	2.00	0.19	2.80	0.08
3	1.92	0.26	3.45	0.15	3.45	0.88	3.12	0.34	1.95	0.04	2.10	0.15	2.79	0.51	2.85	0.78	2.70	0.50	3.00	0.25	4.20	0.09
4	2.56	0.35	4.60	0.24	4.60	0.51	4.16	0.40	2.60	0.01	2.80	0.15	3.72	0.55	3.80	>1.0	3.60	0.62	4.00	0.35	5.60	0.04
5	3.20	0.42	5.75	0.20	5.75	0.47	5.20	0.40	3.25	0.05	3.50	0.12	4.65	0.62	4.75	>1.0	4.50	0.79	5.00	0.42	7.00	0.08
6	3.84	0.37	6.90	0.21	6.90	0.44	6.24	0.36	3.90	0.07	4.20	0.19	5.58	0.65	5.70	>1.0	5.40	>1.0	6.00	0.55	8.40	0.10
7	4.48	0.37	8.05	0.15	8.05	0.38	7.28	0.30	4.55	0.08	4.90	0.27	6.51	0.68	6.65	0.85	6.30	>1.0	7.00	0.74	9.80	0.14
8	5.12	0.29	9.20	0.15	9.20	0.31	8.32	0.20	5.20	0.16	5.60	0.35	7.44	0.49	7.60	0.60	7.20	0.80	8.00	>1.0	11.20	0.11
9	5.76	0.24	10.35	0.16	10.35	0.22	9.36	0.10	5.85	0.10	6.30	0.36	8.37	0.43	8.55	0.51	8.10	0.53	9.00	>1.0	12.60	0.14
Right Bank	6.45	0	11.80	0	11.50	0	10.40	0	6.50	0	7.05	0	9.34	0	9.50	0.30	9.00	0.30	10.00	0.80	14.05	0
Feature Type (riffle, run, or pool)	RUN		RUN		POOL		RUN		RIFFLE		POOL		POOL		POOL		POOL		POOL		RIFFLE	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0depth). This width is the wetted width
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RWC 11-2-07

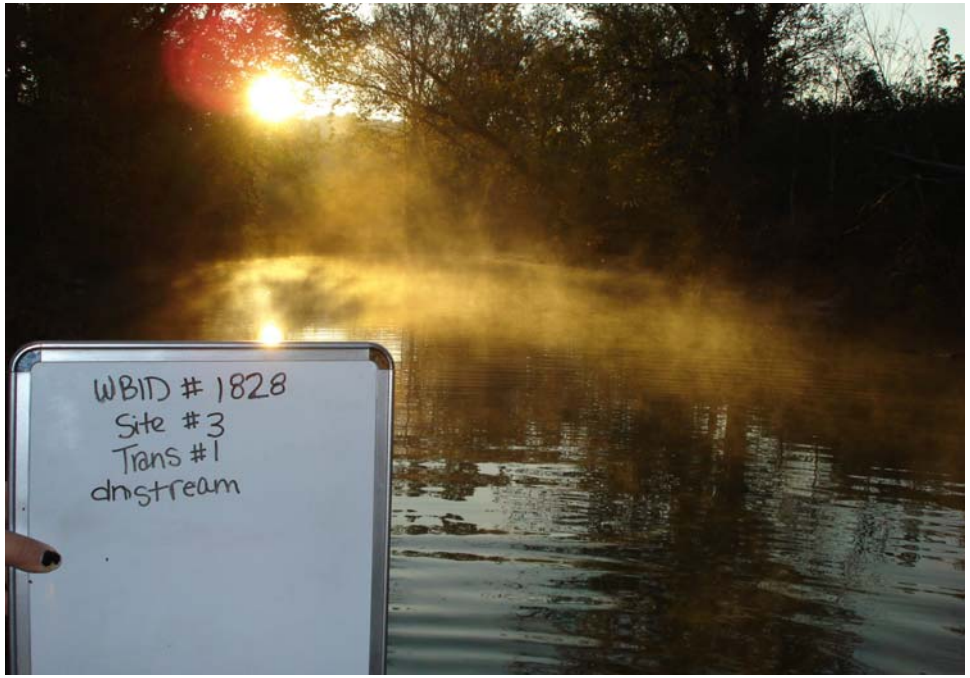
Signed: [signature] Date: 10/30/07

WBID # 1828
Site #1
Trans #1
upstream

WBID # 1828
Site #2
Trans #1
dnstream

WBID # 1828
Site #4
Trans #1
upstream

WBID # 1828
Site #1
Trans #1
dnstream


WBID # 1828
Site #3
Trans #1
dnstream

WBID # 1828
Site #4
Trans #1
dnstream

WBID # 1828
Site #2
Trans #1
upstream

WBID # 1828
Site #3
Trans #1
upstream