



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 2349 Railey Creek

Submitted by
Olsson Associates

To
Missouri Department of Natural Resources
Water Protection Program

On

October 14, 2008

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet A – Water Body Identification

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

Water Body Name (from USGS 7.5' quad): Railey Cr.
Missouri Water Body Identification (WBID) Number: 2349
8-digit HUC: 11010002
County(ies), Listed Upstream to Downstream: Stone
Upstream Legal Description (from Table H): Hwy 13
Downstream Legal Description (from Table H): Mouth
Number of sites evaluated: 4
List all site numbers, <u>consecutively upstream to downstream</u> : 1, 2, 3, 4
Include a Site Location Map(s). The map must include all requirements detailed in the <i>Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol</i> (Section IV.D.8.a).

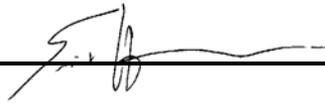
II. Facility Information (list all permitted discharges to this water body segment)

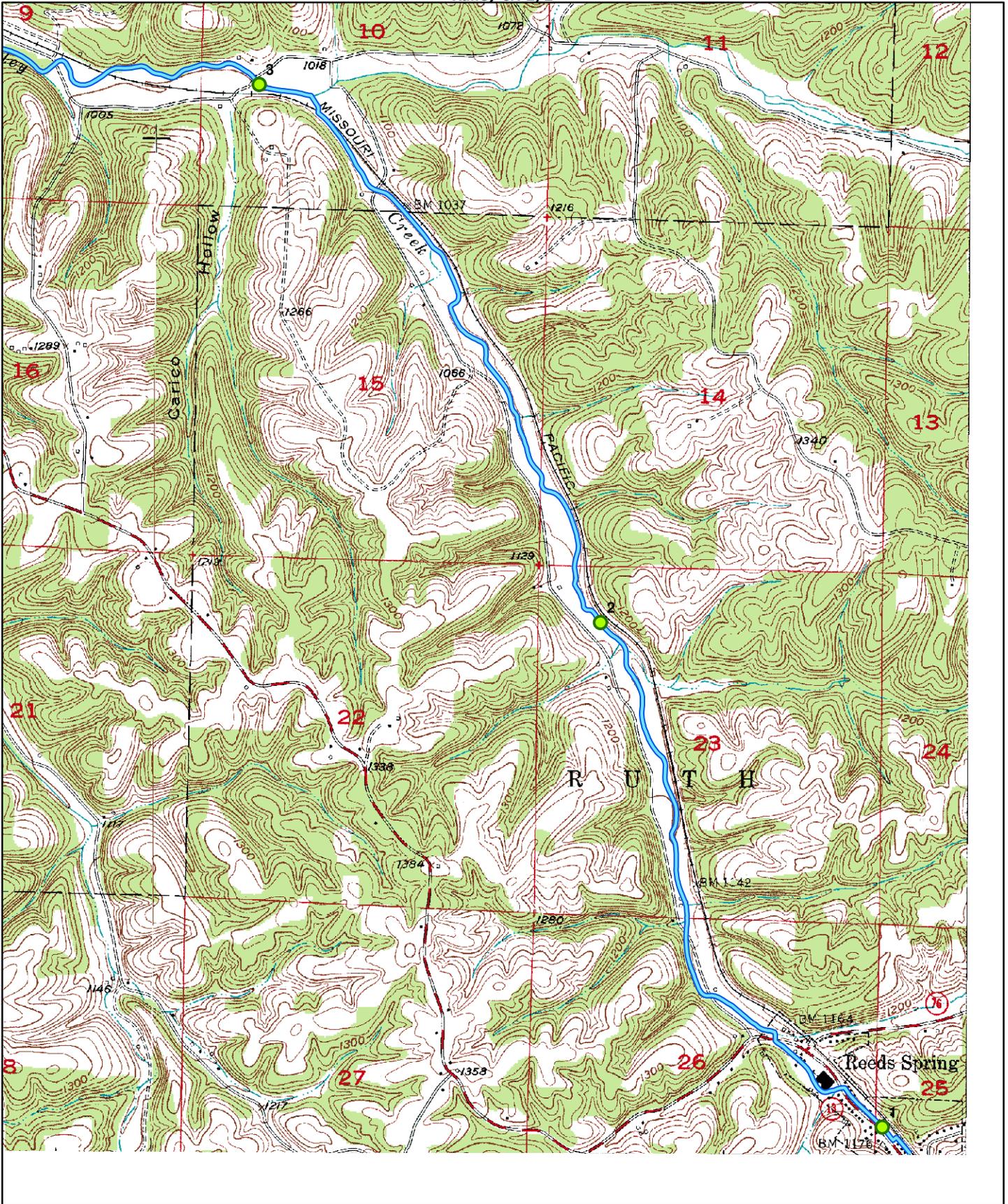
Facility Name(s) and Permit Number(s): Reeds Spring WWTF MO 0094137 Rocky Top MHP WWTF MO 0108383

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

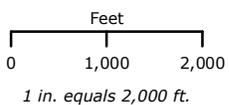
Name of Surveyor: Eric Hertzler	Telephone Number: 417-890-8802
Organization/Employer: Olsson Associates	

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

Signed:  **Date:** 08-27-08

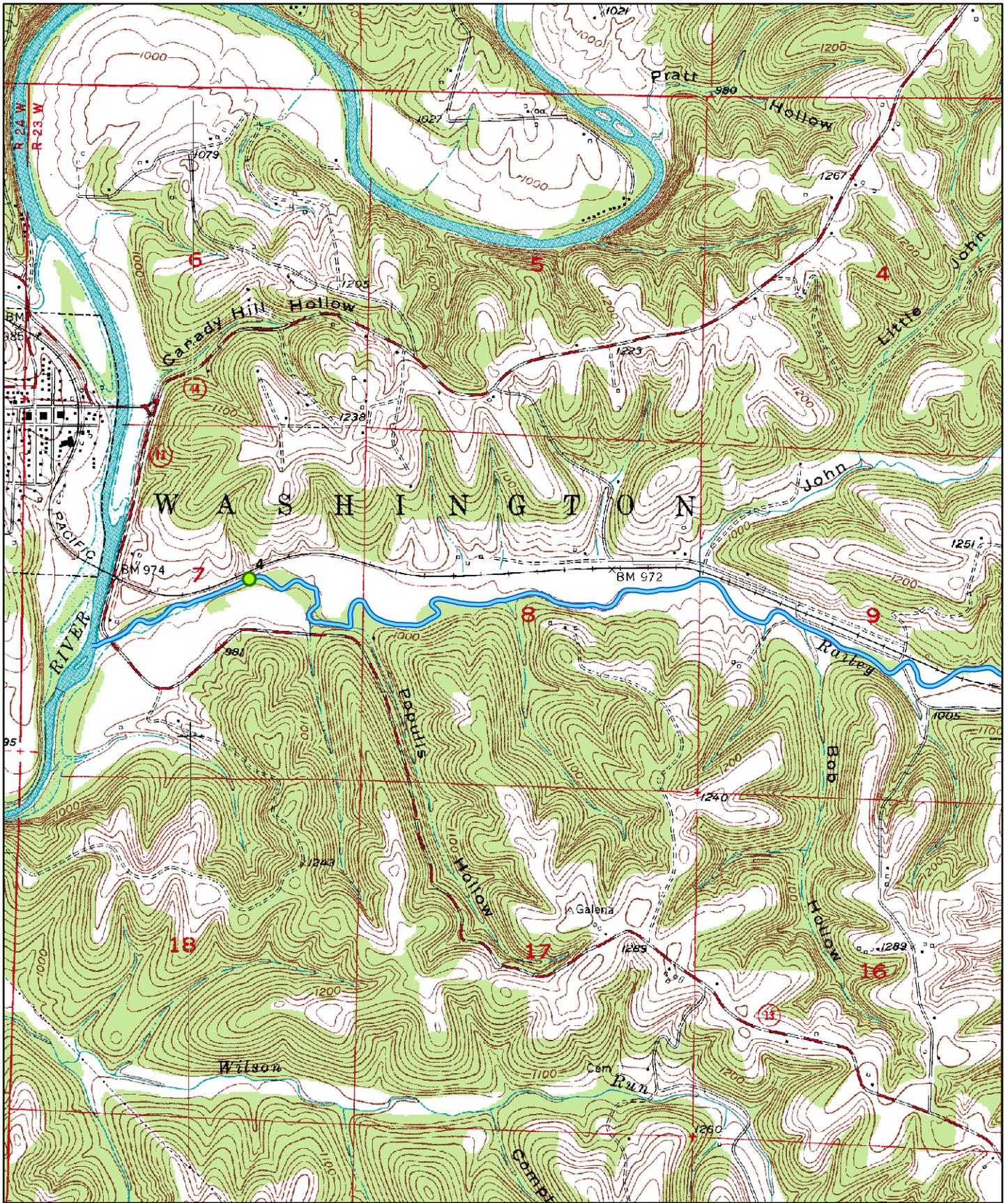


**MISSOURI RECREATIONAL
USE ATTAINABILITY ANALYSIS**



Stream: Railey Cr.
WBID: 2349

Map Sheet: 1/2
County: Stone

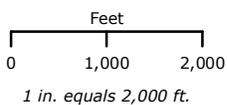


Rayley Cr. 1/2

**MISSOURI RECREATIONAL
USE ATTAINABILITY ANALYSIS**

Stream: Rayley Cr.
WBID: 2349

Map Sheet: 2/2
County: Stone



WBID # 2349

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

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

(must be completed for each site)

Date & Time: 08-27-08 8:37 a.m.	Location Description (e.g., road crossing): 265 Hwy. (Drainage ditch)
Stream Name: Railey Cr.	
Current Weather Conditions: sunny	Facility Name(s): Reeds Spring WWTF Rocky Top MHP WWTF
Weather Conditions for Past 10 days: 0.49" @ Lake Taneycomo	Permit Number(s): MO 0108383 MO 0094137
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)					
Site 01	Easting (UTM X): 466121	Northing (UTM Y): 4067337	Horizontal Accuracy: (EPE / FOM / PDOP)	39 ft. Meters	
Site 11	Easting (UTM X): 466000	Northing (UTM Y): 4067446	Horizontal Accuracy: (EPE / FOM / PDOP)	58 ft. Meters	

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-1-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-1-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

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

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

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

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

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

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input checked="" 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 type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments: In the town of Reeds Spring				

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
<input type="checkbox"/> None of the above	Comments / Other: Sidewalk along drainage ditch.			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

NONE NOTED

Water Characteristics*: (Mark all that apply.)

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

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

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

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

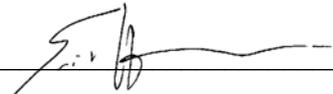
Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

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

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-27-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u> Railey Cr </u> Waterbody ID: <u> 2349 </u> Site #: <u> 1 </u> Estimated Channel Incision: <u> 1.5 (m) (height between low bank width and water) </u> GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u> 466121 </u> UTM Y: <u> 4067337 </u> +/- <u> 39 ft. (meters) </u> 11 UTM X: <u> 466000 </u> UTM Y: <u> 4067446 </u> +/- <u> 58 ft. (meters) </u> Average Stream Width: <u> 1.5 </u> (meters) Length of Survey Segment: <u> 150 (meters) </u> (To determine Length of Reach) (20x average stream width) Field Staff: <u> Eric Hertzler / Austin Lohkamp </u>	Dissolved Oxygen
	Date: <u> 8/27/2008 </u> Time: <u> 8:48 a.m. </u>
	Dissolved Oxygen: <u> 9.43 </u> (mg/L)
	Dissolved Oxygen: <u> 94.6 </u> (% sat)
	Specific Cond: <u> 337 </u> (µS/cm)
	Water Temperature: <u> 20.1 </u> (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.15	0.05	0.15	0.15	0.15	0.05	0.15	0.14	0.15	0.24	0.15	0.05	0.15	0.05	0.15	0.05	0.15	0.05	0.15	0.05	0.15	0.05
2	0.30	0.05	0.30	0.14	0.30	0.05	0.30	0.20	0.30	0.27	0.30	0.05	0.30	0.05	0.30	0.05	0.30	0.07	0.30	0.05	0.30	0.05
3	0.45	0.05	0.45	0.15	0.45	0.05	0.45	0.31	0.45	0.30	0.45	0.05	0.45	0.05	0.45	0.05	0.45	0.05	0.45	0.05	0.45	0.07
4	0.60	0.09	0.60	0.12	0.60	0.05	0.60	0.37	0.60	0.05	0.60	0.05	0.60	0.05	0.60	0.05	0.60	0.05	0.60	0.05	0.60	0.05
5	0.75	0.10	0.75	0.10	0.75	0.05	0.75	0.41	0.75	0.05	0.75	0.05	0.75	0.12	0.75	0.07	0.75	0.05	0.75	0.05	0.75	0.05
6	0.90	0.05	0.90	0.14	0.90	0.05	0.90	0.45	0.90	0.05	0.90	0.05	0.90	0.11	0.90	0.09	0.90	0.05	0.90	0.05	0.90	0.09
7	1.05	0.05	1.05	0.15	1.05	0.05	1.05	0.39	1.05	0.05	1.05	0.07	1.05	0.10	1.05	0.06	1.05	0.05	1.05	0.05	1.05	0.05
8	1.20	0.05	1.20	0.09	1.20	0.05	1.20	0.30	1.20	0.05	1.20	0.09	1.20	0.09	1.20	0.05	1.20	0.05	1.20	0.05	1.20	0.05
9	1.35	0.05	1.35	0.05	1.35	0.05	1.35	0.17	1.35	0.05	1.35	0.10	1.35	0.05	1.35	0.05	1.35	0.05	1.35	0.05	1.35	0.05
Right Bank	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00	1.50	0.00
Feature Type <small>(riffle, run, or pool)</small>	Run	Run																				

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

MAXIMUM 0.45
 MEDIAN 0.05

Surveyor's Signature: _____



Date: 08-27-08

WBID # 2349

Site # 2

Field Data Sheets for Recreational Use Stream Surveys

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

(must be completed for each site)

Date & Time: 08-27-08	Location Description (e.g., road crossing): Residence off of Hwy 13
Stream Name: Railey Cr.	
Current Weather Conditions: sunny	Facility Name(s): Reeds Spring WWTF Rocky Top MHP WWTF
Weather Conditions for Past 10 days: 0.49" @ Lake Taneycomo	Permit Number(s): MO 0108383 MO 0094137
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 464803	Northing (UTM Y): 4069597	Horizontal Accuracy: (EPE / FOM / PDOP)	112 ft. Meters
Site 11	Easting (UTM X): 464741	Northing (UTM Y): 4069767	Horizontal Accuracy: (EPE / FOM / PDOP)	80 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-2-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-2-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

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

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

Site # 2

Field Data Sheets for Recreational Use Stream Surveys

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

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

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input checked="" type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input 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
<input type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

NONE

Water Characteristics*: (Mark all that apply.)

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

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

Site # 2

Field Data Sheets for Recreational Use Stream Surveys

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

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

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

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-27-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u> Railey Cr. </u> Waterbody ID: <u> 2349 </u> Site #: <u> 2 </u> Estimated Channel Incision: <u> 0.41 </u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u> 464803 </u> UTM Y: <u> 4069597 </u> +/- <u> 112 ft. (meters) </u> 11 UTM X: <u> 464741 </u> UTM Y: <u> 4069767 </u> +/- <u> 80 ft. (meters) </u> Average Stream Width: <u> 7 </u> (meters) Length of Survey Segment: <u> 150 </u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u> Eric Hertzler / Austin Lohkamp </u>	Dissolved Oxygen
	Date: <u> 08-27-08 </u> Time: <u> 9:30 a.m. </u>
	Dissolved Oxygen: <u> 5.73 </u> (mg/L)
	Dissolved Oxygen: <u> 61.5 </u> (% sat)
	Specific Cond: <u> 312 </u> (µS/cm)
	Water Temperature: <u> 18.4 </u> (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.11	0.05	0.40	0.06	0.57	0.00	0.76	0.00	0.79	0.00	0.73	0.00	0.94	0.00	0.62	0.00	0.57	0.00	0.84	0.00	0.98	0.00
2	0.22	0.05	0.80	0.14	1.14	0.00	1.52	0.00	1.58	0.00	1.46	0.00	1.88	0.00	1.24	0.00	1.14	0.00	1.68	0.00	1.96	0.00
3	0.33	0.05	1.20	0.21	1.71	0.00	2.28	0.00	2.37	0.00	2.19	0.00	2.82	0.00	1.86	0.00	1.71	0.00	2.52	0.00	2.94	0.00
4	0.44	0.05	1.60	0.27	2.28	0.00	3.04	0.00	3.16	0.00	2.92	0.00	3.76	0.00	2.48	0.00	2.28	0.00	3.36	0.00	3.92	0.00
5	0.55	0.06	2.00	0.31	2.85	0.00	3.80	0.00	3.95	0.00	3.65	0.00	4.70	0.00	3.10	0.00	2.85	0.00	4.20	0.00	4.90	0.00
6	0.66	0.07	2.40	0.34	3.42	0.00	4.56	0.00	4.74	0.00	4.38	0.00	5.64	0.00	3.72	0.00	3.42	0.00	5.04	0.00	5.88	0.00
7	0.77	0.05	2.80	0.20	3.99	0.00	5.32	0.00	5.53	0.00	5.11	0.00	6.58	0.00	4.34	0.00	3.99	0.00	5.88	0.00	6.86	0.00
8	0.88	0.05	3.20	0.17	4.56	0.00	6.08	0.00	6.32	0.00	5.84	0.00	7.52	0.00	4.96	0.00	4.56	0.00	6.72	0.00	7.84	0.00
9	0.99	0.05	3.60	0.12	5.13	0.00	6.84	0.00	7.11	0.00	6.57	0.00	8.46	0.00	5.58	0.00	5.13	0.00	7.56	0.00	8.82	0.00
Right Bank	1.10	0.00	4.00	0.00	5.70	0.00	7.60	0.00	7.90	0.00	7.30	0.00	9.40	0.00	6.20	0.00	5.70	0.00	8.40	0.00	9.80	0.00
Feature Type <small>(riffle, run, or pool)</small>	Riffle		Pool		Dry																	

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

MAXIMUM 0.34
 MEDIAN 0.00

Surveyor's Signature:



Date: 08-27-08

WBID # 2349

Site # 3

Field Data Sheets for Recreational Use Stream Surveys

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

(must be completed for each site)

Date & Time: 08-27-08 10:05 a.m.	Location Description (e.g., road crossing):
Stream Name: Railey Cr.	Upstream of Rd. 176-30 Bridge
Current Weather Conditions: sunny	Facility Name(s):Reeds Spring WWTF Rocky Top MHP WWTF
Weather Conditions for Past 10 days: 0.49" @ Lake Taneycomo	Permit Number(s):MO 0094137 MO 0108383
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 463334	Northing (UTM Y): 4072066	Horizontal Accuracy: (EPE / FOM / PDOP)	103 ft. Meters
Site 11	Easting (UTM X): 463248	Northing (UTM Y): 4072119	Horizontal Accuracy: (EPE / FOM / PDOP)	66 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-3-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-3-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-3-C	Pool				

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

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

Site # 3

Field Data Sheets for Recreational Use Stream Surveys

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

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

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input 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
<input type="checkbox"/> None of the above	Comments / Other: Bridge at downstream end of transect.			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Moss on gravels

Water Characteristics*: (Mark all that apply.)

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

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

Site # 3

Field Data Sheets for Recreational Use Stream Surveys

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

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

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)
Pool	1	9	7	.25	+1

Comments: (Please record any additional comments here.)

Pool @ Bridge crossing (downstream of transect) +1 meter in depth. See photo 2349-3-C.

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-27-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u> Railey Cr. </u> Waterbody ID: <u> 2349 </u> Site #: <u> 3 </u> Estimated Channel Incision: <u> 17 </u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u> 463334 </u> UTM Y: <u> 4072066 </u> +/- <u> 103 ft. </u> (meters) 11 UTM X: <u> 463248 </u> UTM Y: <u> 4072119 </u> +/- <u> 66 ft. </u> (meters) Average Stream Width: <u> 6.5 </u> (meters) Length of Survey Segment: <u> 150 </u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u> Eric Hertzler / Austin Lohkamp </u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u> 08-27-08 </u> Time: <u> 10:20 a.m. </u> Dissolved Oxygen: <u> 3.76 </u> (mg/L) Dissolved Oxygen: <u> 41.6 </u> (% sat) Specific Cond: <u> 365 </u> (µS/cm) Water Temperature: <u> 19.7 </u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1.32	0.00	0.75	0.00	0.73	0.00	0.55	0.00	0.58	0.00	0.78	0.00	0.97	0.00	0.51	0.00	0.34	0.10	0.17	0.05	1.46	0.00
2	2.64	0.00	1.50	0.00	1.46	0.00	1.10	0.00	1.16	0.00	1.56	0.00	1.94	0.00	1.02	0.00	0.68	0.21	0.34	0.05	0.92	0.00
3	3.96	0.00	2.25	0.00	2.19	0.00	1.65	0.00	1.74	0.00	2.34	0.00	2.91	0.00	1.53	0.00	1.02	0.34	0.51	0.08	1.38	0.00
4	5.28	0.00	3.00	0.00	2.92	0.00	2.20	0.00	2.32	0.00	3.12	0.00	3.88	0.00	2.04	0.00	1.36	0.56	0.68	0.10	1.84	0.00
5	6.60	0.00	3.75	0.00	3.65	0.00	2.75	0.00	2.90	0.00	3.90	0.00	4.85	0.00	2.55	0.00	1.70	0.71	0.85	0.11	2.30	0.00
6	7.92	0.00	4.50	0.00	4.38	0.00	3.30	0.00	3.48	0.00	4.68	0.00	5.82	0.00	3.06	0.00	2.04	0.73	1.02	0.09	2.76	0.00
7	9.24	0.00	5.25	0.00	5.11	0.00	3.85	0.00	4.06	0.00	5.46	0.00	6.79	0.00	3.57	0.00	2.38	0.56	1.19	0.05	3.22	0.00
8	10.56	0.00	6.00	0.00	5.84	0.00	4.40	0.00	4.64	0.00	6.24	0.00	7.76	0.00	4.08	0.00	2.72	0.31	1.36	0.05	3.68	0.00
9	11.88	0.00	6.75	0.00	6.57	0.00	4.95	0.00	5.22	0.00	7.02	0.00	8.73	0.00	4.59	0.00	3.06	0.20	1.53	0.05	4.14	0.00
Right Bank	13.20	0.00	7.50	0.00	7.30	0.00	5.50	0.00	5.80	0.00	7.80	0.00	9.70	0.00	5.10	0.00	3.40	0.14	1.70	0.00	4.60	0.00
Feature Type <small>(riffle, run, or pool)</small>	Dry		Pool		Pool		Dry															

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

MAXIMUM 0.73

MEDIAN 0.00

Surveyor's Signature: _____

Date: 8/27/2008

WBID # 2349

Site # 4

Field Data Sheets for Recreational Use Stream Surveys

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

(must be completed for each site)

Date & Time: 08-27-08 11:00 a.m.	Location Description (e.g., road crossing): Off of Hwy 13
Stream Name: Railey Cr.	
Current Weather Conditions: sunny	Facility Name(s): Reeds Spring WWTF Rocky Top MHP WWTF
Weather Conditions for Past 10 days: 0.49" @ Lake Taneycomo	Permit Number(s): MO 0108383 MO 0094137
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)					
Site 01	Easting (UTM X): 459673	Northing (UTM Y): 4072424	Horizontal Accuracy: (EPE / FOM / PDOP)	240 ft.	Meters
Site 11	Easting (UTM X): 459657	Northing (UTM Y): 4072543	Horizontal Accuracy: (EPE / FOM / PDOP)	128 ft.	Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-4-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2349-4-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

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

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

Field Data Sheets for Recreational Use Stream Surveys

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

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

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input checked="" type="checkbox"/> Other:
Comments: Rock and gravel company				

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
<input type="checkbox"/> None of the above	Comments / Other: Road that gravel company uses crosses creek @ upstream end of transect.			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Some moss on gravels.

Water Characteristics*: (Mark all that apply.)

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

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

Field Data Sheets for Recreational Use Stream Surveys

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

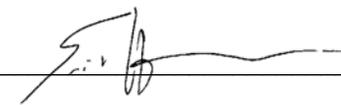
Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

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

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-27-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Railey Cr.</u> Waterbody ID: <u>2349</u> Site #: <u>4</u> Estimated Channel Incision: <u>0.32</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>459673</u> UTM Y: <u>4072424</u> +/- <u>240</u> ft. (meters) 11 UTM X: <u>459657</u> UTM Y: <u>4072543</u> +/- <u>128</u> ft. (meters) Average Stream Width: <u>8</u> (meters) Length of Survey Segment: <u>160</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	Dissolved Oxygen Date: <u>08-27-08</u> Time: <u>11:04 a.m.</u> Dissolved Oxygen: <u>8.35</u> (mg/L) Dissolved Oxygen: <u>93.2</u> (% sat) Specific Cond: <u>361</u> (µS/cm) Water Temperature: <u>20.7</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1.02	0.12	1.31	0.44	0.35	0.05	0.40	0.05	0.51	0.31	0.61	0.19	0.53	0.05	0.31	0.05	0.82	0.10	1.31	0.42	1.27	0.34
2	2.04	0.10	2.62	0.98	0.70	0.05	0.80	0.05	1.02	0.22	1.22	0.25	1.06	0.05	0.62	0.05	1.64	0.12	2.62	0.62	2.54	0.42
3	3.06	0.05	3.93	0.78	1.05	0.05	1.20	0.10	1.53	0.10	1.83	0.37	1.59	0.18	0.93	0.11	2.46	0.15	3.93	0.61	3.81	0.58
4	4.08	0.05	5.24	0.31	1.40	0.13	1.60	0.05	2.04	0.09	2.44	0.41	2.12	0.25	1.24	0.19	3.28	0.05	5.24	0.49	5.08	0.33
5	5.10	0.05	6.55	0.25	1.75	0.20	2.00	0.07	2.55	0.05	3.05	0.39	2.65	0.34	1.55	0.25	4.10	0.05	6.55	0.42	6.35	0.25
6	6.12	0.05	7.86	0.05	2.10	0.23	2.40	0.08	3.06	0.05	3.66	0.40	3.18	0.31	1.86	0.29	4.92	0.05	7.86	0.40	7.62	0.27
7	7.14	0.05	9.17	0.05	2.45	0.19	2.80	0.05	3.57	0.05	4.27	0.38	3.71	0.27	2.17	0.24	5.74	0.27	9.17	0.27	8.89	0.41
8	8.16	0.05	10.48	0.05	2.80	0.09	3.20	0.05	4.08	0.05	4.88	0.36	4.24	0.17	2.48	0.27	6.56	0.16	10.48	0.25	10.16	0.35
9	9.18	0.05	11.79	0.05	3.15	0.05	3.60	0.07	4.59	0.05	5.49	0.28	4.77	0.05	2.79	0.23	7.38	0.05	11.79	0.13	11.43	0.31
Right Bank	10.20	0.00	13.10	0.00	3.50	0.00	4.00	0.00	5.10	0.00	6.10	0.00	5.30	0.00	3.10	0.00	8.20	0.00	13.10	0.00	12.70	0.00
Feature Type <small>(riffle, run, or pool)</small>	Riffle		Pool		Riffle		Riffle		Riffle		Run		Run		Riffle		Run		Run		Run	

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

MAXIMUM 0.98

MEDIAN 0.11

Surveyor's Signature: _____



Date: 08-27-08

