East Branch
Recreational Use Attainability Analysis

December 2005

Prepared for:
UAA Review Committee
Water Quality Monitoring & Assessment Section
Water Protection Program
MISSOURI DEPARTMENT OF NATURAL RESOURCES
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TABLE OF CONTENTS

LIST OF APPENDICIES

LIST OF TABLES

LIST OF FIGURES

I. PROJECT BACKGROUND

At the request of the City of Harrisonville, the East Branch of the South Grand River was evaluated by MEC Water Resources, Inc (MEC) for existing and attainable Whole Body Contact Recreation (WBCR) uses in October 2005. The assessment described herein is expected to meet or exceed the requirements set forth by the MDNR for conducting a Recreational Use Attainability Analysis (UAA) (MDNR 2004).

II. STUDY AREA

East Branch (Figure 1) is a Class C water of the state and a tributary to the South Grand River near Harrisonville, Missouri (Blunt 2004). Uses currently designated for East Branch include Protection of Warm-Water Aquatic Life and Human Health – Fish Consumption, and Livestock and Wildlife Watering. The Category B Whole Body Contact Recreation use was added to East Branch in the September 2005 recommended revisions to 10 CSR 20-7.031.

Draining a 83 $mi.^2$ watershed in Cass County, East Branch is dominated by cool season grassland (53.6%) and row and close grown crop agriculture (25.7%) according to 1993 Thematic Mapper imagery. The East Branch watershed is contained within the South Grand Basin (8 digit HUC 10290108) and the State assigned water body identification number is 1264.

The City of Harrisonville Wastewater Treatment Plant (MO-0028070) discharges to an unnamed, unclassified tributary to Town Creek, which is also unclassified. The treatment plant outfall is 2.13 miles upstream of East Branch, the first classified receiving stream segment.

III. METHODS AND MATERIALS

Procedures developed by MDNR for conducting Recreational UAAs (MDNR 2004) were the primary reference for this study. In summary, MDNR UAA procedures contain the minimum elements listed below:

- Survey should generally be conducted during the regulatory recreational season (April 1 to October 31);
- Surveys should be conducted during baseflow conditions;
- Recreational assessments should be performed at a minimum of three publicly accessible sites along the stream reach of interest;
- All sites shall be marked on a 1:24,000 USGS topographic map
- A photographic record of each site that includes upstream and downstream views, in addition to any evidence of observed or potential recreational uses; and
- Interviews of persons present during the time of survey and nearby-residents.

In addition to MDNR minimum requirements, MEC staff collected the following data within an assessment reach having a total length of approximately twenty times bankfull width:

- Stream hydrogeometry (width, depth, velocity, bank slope);
- Riffle, pool, run (stream mesotype) composition; and
- Riparian corridor characteristics

Hydrogeometry measurements were obtained along three equally spaced cross-sections within each mesotype unless one mesotype dominated the entire upstream or downstream reach, e.g. one large bridge scour pool. Five equally spaced cross-sections were taken for situations where a single mesotype dominated the assessment reach.

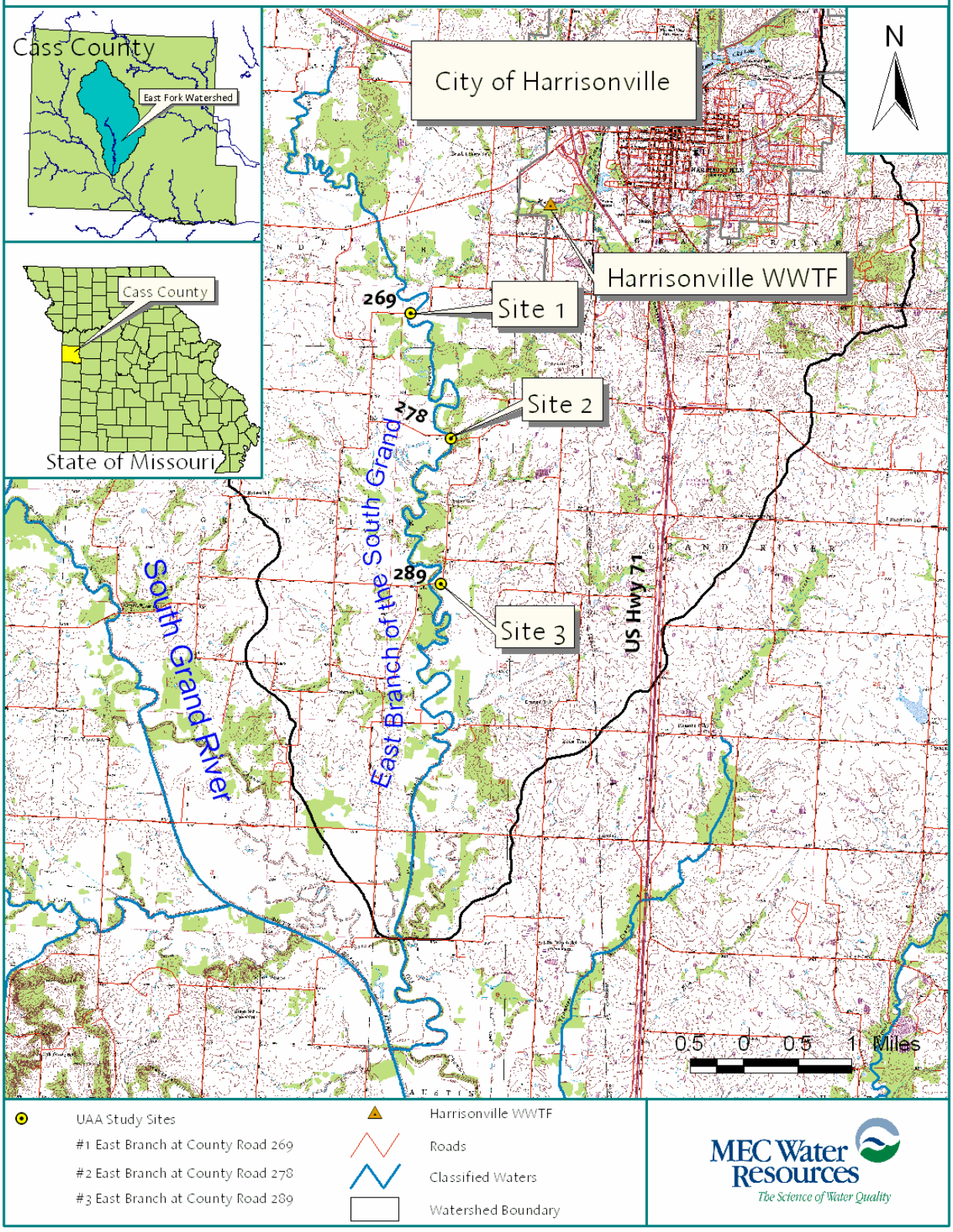
IV. RESULTS & DISCUSSION

The following discussion is provided to aid decision-makers in evaluating appropriate existing or potential recreational uses for the East Branch of the South Grand River. Although summarized in the following paragraphs, the field data sheets required by MDNR UAA protocols are included in Appendix A. Additional data collected during the survey are included in Appendix B.

Weather Conditions

Three sites (Figure 1) within classified sections of the East Branch of the South Grand River were assessed on October, 17, 2005, using methods described in Section IV: 1264_Site 1_County Road 269 Bridge Crossing, 1264_Site 2_County Road 278 Bridge Crossing, and 1264_Site 3_County Road 289 Bridge Crossing. Surveys were conducted during presumed low-flow conditions as evidenced by precipitation data from the Blue River USGS Gage Station 6893080 near Stanley, KS (Table 1).

Figure 1. East Fork Study Area and Sites



Overall, weather conditions were stable with no significant rainfall occurring for two weeks prior to the evaluation (Table 1). Air temperatures reached approximately 75°F and skies were clear. Weather conditions are not believed to have precluded or limited recreational opportunities during the survey.

Table 1. Two-Week Antecedent Rainfall from Blue River near Stanley, KS. USGS Gage Station 6893080.

Date (m/d/yyyy)	Precipitation (inches)
10/16/2005	0.00
10/15/2005	0.00
10/14/2005	0.00
10/13/2005	0.00
10/12/2005	0.00
10/11/2005	0.00
10/10/2005	0.10
10/9/2005	0.00
10/8/2005	0.00
10/7/2005	0.00
10/6/2005	0.00
10/5/2005	0.00
10/4/2005	0.00
10/3/2005	0.00

Table 2. Streamflow Conditions from Big Bull Creek USGS Gage Station 06915000, Hillsdale, KS.

Date (m/d/yyyy)	Streamflow (cfs)
10/16/2005	13
10/15/2005	13
10/14/2005	13
10/13/2005	14
10/12/2005	14
10/11/2005	14
10/10/2005	13
10/9/2005	13
10/8/2005	13
10/7/2005	14
10/6/2005	14
10/5/2005	14
10/4/2005	14
10/3/2005	14

Site Characterization

Sites surveyed as part of this study are publicly accessible areas along classified segments of the East Branch of the South Grand River. Study results are discussed for each site to provide a description of differences between assessment reaches

Site 1. County Road 269 Bridge Crossing (38.62940, -94.39337) 2.42 miles from WWTP.

The riparian areas near the County Road 269 bridge crossing consist of trees and shrubs with some grasses. Agriculture fields are also present nearby. Channel substrate was predominately sand with gravel and cobble present (Figures 2 and 3). Stream bank slopes are steep at this road crossing.

Figure 2 East Branch Site 1 Downstream View

Figure 3. East Branch Site 1 Upstream View

Mean depth along an 840 ft. assessment reach was 1.20 ft. as determined from 7 transects (Appendix B). The maximum depth observed at this location was 2.84 ft.

There was no evidence of WBCR use observed at Site 1. In addition, no individuals were seen or found to be available for interviews near the bridge during the survey.

MEC staff concludes that WBCR is neither an existing or an attainable use at this site based on limited access to the stream imposed by steep banks, the absence of observed recreational uses, and low-flow, shallow conditions.

Site 2. County Road 278 Bridge Crossing (38.61278, -94.38615) 4.63 Miles from WWTF

The riparian area near the County Road 278 bridge crossing consists of low growing brush and grasses, with some mature deciduous trees and row crops (Figures 4 and 5). The stream banks are steeply sloping and covered with brush and grasses. Stream substrate consisted of bedrock and cobble with sand and silt present.

Mean depth along a 1,000 ft. assessment reach was 1.79 feet as determined from 9 transects (Appendix B). The maximum depth observed at this location was 3.74 ft.

Figure 4. East Branch Site 2 Downstream View

Figure 5. East Branch Site 2 Upstream View

MEC staff did not observe any direct or indirect evidence of WBCR at Site 2. A trot line was found from the bridge; however, no individuals were seen or found to be available for interviews near the bridge crossing at the time of the survey. Access to stream may be impeded by the presence of fencing.

MEC staff concludes that WBCR is an attainable use at this site based on maximum depth of over a meter within the surveyed reach and an average depth that is greater than a half meter.

Site 3. County Road 289 Bridge Crossing (38.61287, -94.38585) 7.16 Miles from WWTF

Stream banks near the County Road 289 bridge crossing are steep sloping and vegetated with grasses and brush (Figures 6 and 7). Riparian areas immediately adjacent to the stream are primarily vegetated by trees and brush, with agriculture fields nearby. The stream channel was observed to consist of mud/clay, gravel, and sand.

Figure 6 East Branch Site 3 Downstream View

Figure 7 East Branch Site 3 Upstream View

Mean depth along a 600 ft. assessment reach was 1.15 ft. as determined from 14 transects (Appendix B). The maximum depth observed at this location was 3.21 ft.

MEC staff did not observe any direct or indirect evidence of WBCR at Site 3. No individuals were seen or found to be available for interviews near the bridge crossing at the time of the survey. MEC staff concludes that WBCR is not an existing use at the surveyed reach.

V. WHOLE BODY CONTACT USE ATTAINABILITY RECOMMENDATION

The surveyed reaches of East Branch at Site 1 (County Road 269 Bridge Crossing) do not currently support WBCR uses due to the to depth criteria associated with ephemeral, intermittent, or low flow conditions set forth in MDNR UAA guidance. The surveyed reaches at Site 2 (County Road 269 Bridge Crossing) exceeded the WBCR maximum depth criteria and the mean depth critieria by 0.46 feet and 0.15 feet, respectively. The surveyed reaches at Site 3 (County Road 289 Bridge Crossing) were below the WBCR depth criteria. Based on reach depth measurements and lack of observed recreation use, it is recommended that WBCR be removed upstream of Site 2.

VI. REFERENCES

Blunt, R. 2004. Code of State Regulations; Missouri Water Quality Standards, Title 10, Division 20, Chapter 7.

Missouri Department of Natural Resources. 2004. Recreational Use Attainability Analysis Protocol. Water Protection Program, Jefferson City, MO.

Appendix A

MDNR Field Data Sheets

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet A - Water Body Identification

Water Body Name: (from USGS 7.5' quad)	East Branch
8-digit HUC:	10290108
Missouri WBID #:	1264
County:	Cass
Upstream Legal Description:	SW ¼ NW ¼ NW ¼ 7, 44N, 31W
Downstream Legal Description:	SE ¼ NE ¼ SW ¼ 19, 44N, 31W
Upstream Coordinates: (UGS 84, ddd.ddddd)	38.62955 -94.39287
Downstream Coordinates: (UGS 84, ddd.ddddd)	38.59338 -94.38907
Discharger Facility Name(s):	Harrisonville WWTP
Discharger Permit Number(s):	MO 0028070
Number of Sites Evaluated:	3
Name of Surveyor and Telephone Number:	Rence Martin 573-443-4100
Organization:	MEC Water Resources, Inc.
Position:	Env. Specialist

I, the undersigned, hereby affirm to the best of my knowledge, that all information reported on this UAA datasheet is true and accurate.

Signed: _____ **Date:** 10/17/05

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization

(A separate data sheet must be completed for each site)

Missouri WBID #: 1264		Site Location Description: CR 269 Site 1
Site Lat/Long: 38.62940 094.39337		
Date & Time: 10/17/05 1145		Facility Name: Harrisonville WWTP
Personnel: RM / NDM 75°		Permit Number:
Current Weather Conditions: Clear/Windy		Weather Conditions for Past 7 days: Dry / Sunny
Photo Ids: Upstream: 1-3	Downstream: 4,5	Other: —

Used Observed*:

☐ 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, frequency of use, photo-documentation of evidence of recreational uses, etc.

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	☐ Campgrounds
☐ Boating accesses	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ No trespass sign	☐ Fence	☒ Steep slopes	☒ Other: Ag. Fields	

Evidence of Human Use*:

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

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

*Some of this information is not intended to directly influence a decision on any one particular recreational use analysis but may point to conditions that need further analysis or that effect another use.

Page Two – Data Sheet B for WBID #: 1264 Site 1

Stream Morphology:

Upstream View Physical Dimensions: See Appendix B in Report

☐ **Riffle**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Run**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Pool**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Flow**	Present? Yes No		Estimated (ft^3/sec):	

Downstream View Physical Dimensions: See Appendix B in Report

☐ Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Flow	Present? Yes No		Estimated (ft^3/sec):	

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

10 %Cobble	40 %Gravel	40 %Sand	5 %Silt	%Mud/Clay	5 %Bedrock

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

—

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

Comments: Please attach additional comments (including information from interviews) to this form.

*This information is not to be used solely for removal of whole body contact recreation 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.

I, the undersigned, hereby affirm to the best of my knowledge, that all information reported on this UAA datasheet is true and accurate.

Signed: [signature] **Date:** 10/17/05

Organization: Mec Water Resources **Position:** Env. Specialist

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization

(A separate data sheet must be completed for each site)

Missouri WBID #: 1264		Site Location Description: CR 278 Site 2
Site Lat/Long: 38.61278 94.38615		
Date & Time: 10/17/05		Facility Name: Harrisonville WWTP
Personnel: RM/NDM		Permit Number:
Current Weather Conditions: Clear 75°		Weather Conditions for Past 7 days: Dry
Photo Ids: Upstream: 6, 7	Downstream: 8, 9	Other: 10 - fishing tackle

Used Observed*:

☐ 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, frequency of use, photo-documentation of evidence of recreational uses, etc.

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	☐ Campgrounds
☐ Boating accesses	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ No trespass sign	☒ Fence	☒ Steep slopes	☒ Other: Ag Fields	

Evidence of Human Use*:

☒ Roads Gravel	☐ Foot paths/prints	☐ Dock/platform	☐ Livestock Watering	☐ RV/ATV Tracks
☐ Rope swings	☐ Camping Sites	☐ Fire pit/ring	☐ NPDES Discharge	☒ Fishing Tackle pic #10
☒ Other: Trot line from Bridge				

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

*Some of this information is not intended to directly influence a decision on any one particular recreational use analysis but may point to conditions that need further analysis or that effect another use.

Page Two – Data Sheet B for WBID #: 1264 Site 2

Stream Morphology:

Upstream View Physical Dimensions: See Appendix B in Report

☐ **Riffle**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Run**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Pool**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Flow**	Present? Yes No		Estimated (ft^3/sec):	

Downstream View Physical Dimensions: See Appendix B in Report

☐ Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Flow	Present? Yes No		Estimated (ft^3/sec):	

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

20 %Cobble	%Gravel	20 %Sand	10 %Silt	%Mud/Clay	50 %Bedrock

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

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 – leafy debris – film

Comments: Please attach additional comments (including information from interviews) to this form.

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Signed: [signature] Date: 10/17/05

Organization: MEC Water Resources Position: Env. Specialist

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization

(A separate data sheet must be completed for each site)

Missouri WBID #: 1264	Site Location Description:
Site Lat/Long: 38.61287 94.38585	CR 289 Site 3
Date & Time: 10/12/05 1700	Facility Name: Harrisonville WWTP
Personnel: RM / NDM	Permit Number:
Current Weather Conditions: Clear 75°	Weather Conditions for Past 7 days:
Photo Ids: Upstream: 11,12	Downstream: ~~11~~ RM 13, 14 Other: —

Used Observed*:

☐ 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, frequency of use, photo-documentation of evidence of recreational uses, etc.

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	☐ Campgrounds
☐ Boating accesses	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ No trespass sign	☐ Fence	☒ Steep slopes	☒ Other: Ag. fields	

Evidence of Human Use*:

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

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

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Page Two – Data Sheet B for WBID #: 1264 Site 3

Stream Morphology:

Upstream View Physical Dimensions: See Appendix B in Report

☐ **Riffle**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Run**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Pool**	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ **Flow**	Present? Yes No		Estimated (ft^3/sec):	

Downstream View Physical Dimensions: See Appendix B in Report

☐ Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
☐ Flow	Present? Yes No		Estimated (ft^3/sec):	

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

%Cobble	%Gravel	%Sand	%Silt	%Mud/Clay	%Bedrock
	25	25		50	

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

little algae along riffle

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 film/leafy debris

Comments: Please attach additional comments (including information from interviews) to this form.

*This information is not to be used solely for removal of whole body contact recreation 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.

I, the undersigned, hereby affirm to the best of my knowledge, that all information reported on this UAA datasheet is true and accurate.

Signed: Anne Mart **Date:** 10/17/05

Organization: Mtn Water Resources **Position:** Environ. Specialist

Appendix B. Stream Morphology Information

1264_Site 1_ East Branch of the South Grand River 2.42 Miles from WWTF

Length of Assessment Reach (ft.)		840		
Transect	Reach Type	Type Length	Mean Depth	Maximum Depth
(#)	(Riffle, Pool, Run, Dry)	(ft.)	(ft.)	(ft.)
T-Bridge	Run	420	0.69	1.26
T1-1	Run		1.20	2.16
T1-2	Run		1.29	2.08
T1-3	Run		1.17	1.76
T1-4	Run	420	0.28	1.12
T1-5	Run		1.50	1.88
T1-6	Run		2.15	2.84

Maximum Observed Depth (ft.)	2.84
Mean Assessment Reach Depth (ft.)	1.20

1264_Site 2_East Branch of the South Grand River 4.63 Miles from WWTF

Length of Assessment Reach (ft.)		1000		
Transect	Reach Type	Type Length	Mean Depth	Maximum Depth
(#)	(Riffle, Pool, Run, Dry)	(ft.)	(ft.)	(ft.)
T-Bridge	Run	500	2.41	3.36
T2-1	Run		2.36	3.68
T2-2	Run		2.73	3.74
T2-3	Run		2.65	3.48
T2-5	Run	300	2.05	2.68
T2-6	Run		2	2.66
T2-7	Run		1.56	1.96
T2-8	Run		0.6	1.14
T2-9	Riffle	200	0.09	0.52
T2-10	Riffle		0.27	0.64
T2-11	Riffle		0.20	0.52
T2-12	Riffle		0.27	0.64
T2-13	Riffle		0.57	0.88

Maximum Observed Depth (ft.)	3.74
Mean Assessment Reach Depth (ft.)	1.79

1264_Site 3_East Branch of the South Grand River 7.16 Miles from WWTF

Length of Assessment Reach (ft.)		600		
Transect	Reach Type	Type Length	Mean Depth	Maximum Depth
(#)	(Riffle, Pool, Run, Dry)	(ft.)	(ft.)	(ft.)
T3-Bridge		300	0.36	0.32
T3-1	Riffle		0.17	0.44
T3-2	Riffle		0.30	0.66
T3-3	Riffle		0.94	3.2
T3-4	Riffle		0.17	0.38
T3-5	Riffle		0.16	0.36
T3-6	Run		0.95	1.48
T3-7	Run		1.46	2.04
T3-8	Run		1.19	1.78
T3-9	Run		0.69	1.06
T3-10	Run		0.58	1.42
T3-11	Pool	300	1.88	3.22
T3-12	Pool		1.64	2.72
T3-13	Pool		1.4	2.16

Maximum Observed Depth (ft.)	3.21
Mean Assessment Reach Depth (ft.)	1.15