

100-001

# ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

Dan Flowers  
Director  
Telephone (501) 569-2000



P.O. Box 2261  
Little Rock, Arkansas 72203-2261  
Telefax (501) 569-2400

September 17, 2002

Randal Looney  
Federal Highway Administration  
3128 Federal Office Building  
Little Rock, Arkansas 72201

Re: Biological Assessment for *Potamilus capax*  
AHTD Job Number 100381  
Ditch No. 10 Structure & Approaches  
Poinsett County

Dear Randal:

Enclosed are two copies of the referenced biological assessment. Please forward to the U. S. Fish and Wildlife Service for their review and subsequent biological opinion regarding impacts of the project to *Potamilus capax*. If you have questions or need additional information, please give me a call.

Sincerely,

A handwritten signature in black ink, appearing to read "JLH".

John L. Harris  
Section Head-Special Studies  
Environmental Division

JLH/pb

Enclosures

BIOLOGICAL ASSESSMENT

OF

*POTAMILUS CAPAX* (GREEN, 1832)  
FAT POCKETBOOK

FOR

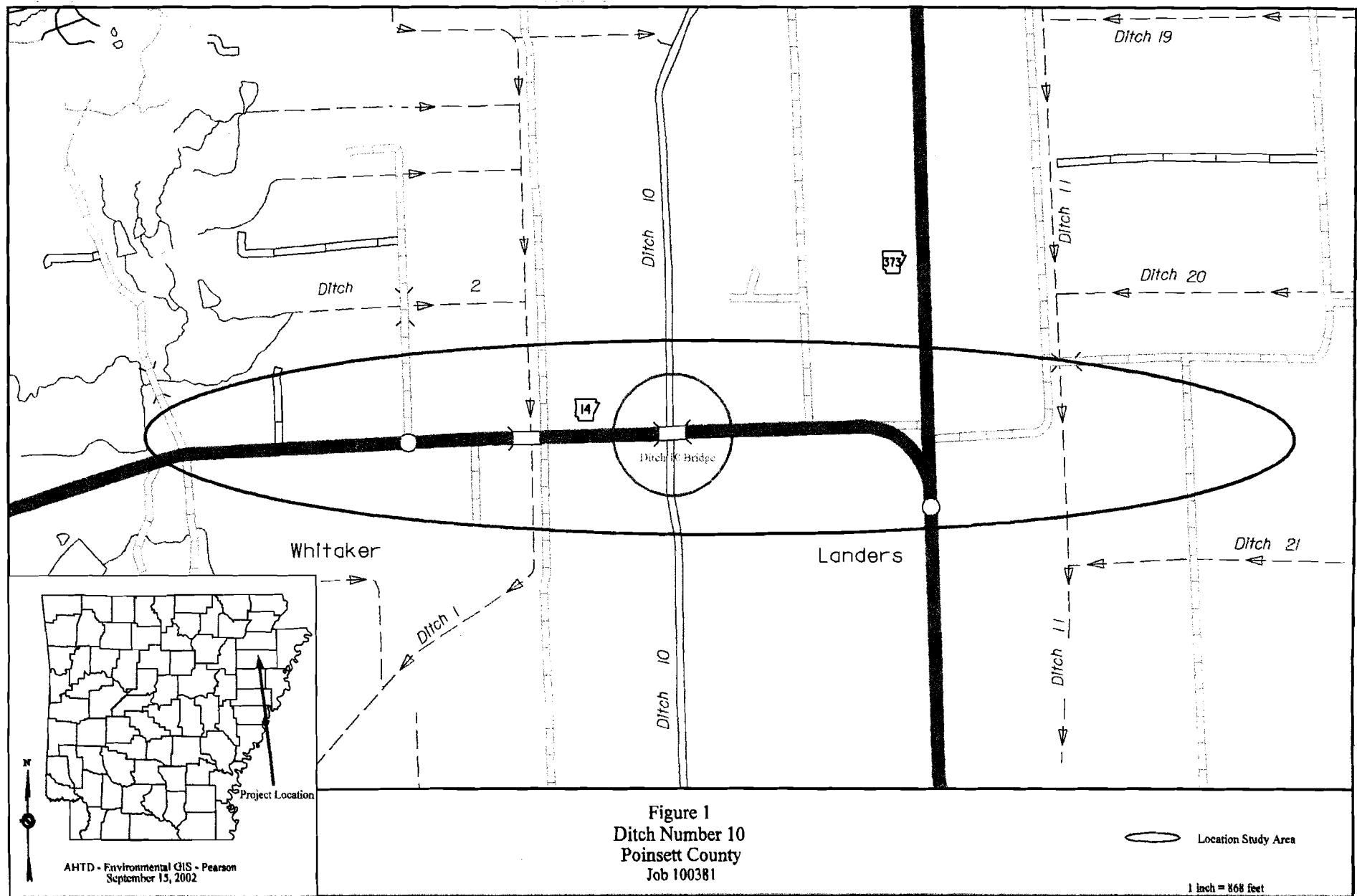
AHTD JOB NUMBER 100381  
DITCH NO. 10 STR. & APPRS.  
ARKANSAS HIGHWAY 14  
POINSETT COUNTY, ARKANSAS

PREPARED BY: JOHN L. HARRIS, PH. D.  
ENVIRONMENTAL DIVISION  
ARKANSAS HIGHWAY & TRANSPORTATION DEPARTMENT  
LITTLE ROCK, ARKANSAS

Introduction

The Arkansas Highway and Transportation Department (AHTD) is planning to replace the Arkansas Highway 14 bridge across Ditch 10 between Harrisburg and the junction of AR Hwy 14 and AR Hwy 373, Poinsett County, Arkansas (Figure 1). The AHTD proposes to replace the existing structure on existing alignment and construct a temporary detour bridge approximately 12.2 meters (40 feet) downstream of the existing bridge centerline. Proposed construction plans are located in Appendix A.

The St. Francis River system is inhabited by the federally endangered fat pocketbook (*Potamilus capax*) (Ahlstedt and Jenkinson 1991). Ahlstedt and Jenkinson (1991) summarized the results of 144 mainstem and tributary (ditch) sites covering approximately 400 river kilometers (250 river miles). These included six sample sites in



Ditch 10 including the proposed project location. Ahlstedt and Jenkinson reported live specimens of the fat pocketbook were collected both upstream and downstream of the proposed project area. Five live individuals of the fat pocketbook were encountered at the AR Hwy. 214 crossing which is approximately 4.0 km upstream of the proposed project area. Three live and 2 fresh-dead specimens were observed at the AR Hwy. 373 crossing approximately 10.4 km downstream of the proposed project area. No specimens were observed at the proposed project area.

Due to the potential for occurrence of *Potamilus capax* at the proposed project site, it was determined that a mussel survey of the site would be conducted. The following summarizes the results of that survey and the potential for impacts to the endangered *P. capax*.

### Survey Methods

J. L. Harris and W. E. Bailey conducted a mussel survey of the project area on 22 August 2002. The surveyors anticipated utilizing dive techniques with Hookah rig apparatus supported from a boat mounted dive platform. However, water level on the survey date was so low that it was impossible to launch a boat. Water depth in the project area was less than 1.0 meter, and most of the survey area outside of the existing bridge was less than 0.5 m deep. Therefore, the survey was conducted using hand grubbing techniques.

A preliminary reconnaissance of the project area was conducted to determine if concentrations of mussels existed. It was determined that no mussel concentrations were present, so a total search was conducted simultaneously along both banks in thalweg-like areas that were approximately 2-3 meters wide. Timed searches were conducted along each of these areas, and the search area encompassed was estimated for each individual search. A total of seven timed searches were performed during the survey.

LHB 1 and RHB 1 search areas extended from approximately 100 meters upstream of the existing bridge downstream to the bridge. Search areas LHB 2 and RHB 2 extended from the existing bridge downstream for approximately 100 meters. Search

area RHB 3 extended from 100 m downstream of the existing bridge to 300 m downstream of the existing bridge. Both searchers concentrated on the same side of the stream in this area, so the search area was 3-4 m in width. The LHB was not searched extensively within this area due to shallow water conditions. Search areas LHB 4 and RHB 4 extended from approximately 300 m downstream of the existing bridge to 350 m below the existing bridge. Approximations of these search areas are illustrated in Figure 2.

All specimens encountered were collected, bagged and brought to the shore for identification and enumeration. Specimens of endangered species were measured to the nearest 0.1 mm for length, width, and height using vernier calipers. Each fat pocketbook specimen was etched with a unique number using a battery powered dremel tool.

Following identification, specimens were bagged and held in the river until completion of the survey. Specimens of *P. capax* were replaced in the river in the approximate vicinity where they were collected, and the location was marked. All other specimens were relocated to suitable habitat approximately 400-450 meters downstream of the existing bridge.

## Results

Timed search results are presented in Table 1. A total of 8.5 man-hours of search time were expended during the survey. Nomenclature follows Turgeon *et al.* (1998). A total of 188 specimens representing 14 species were recovered from the survey area. *Quadrula nodulata* (30.9%), *Q. quadrula* (26.1%), and *Amblema plicata* (11.7%) were the dominant species in the assemblage. Field data sheets are located in Appendix B.

Three *Potamilus capax* were recovered during the searches, all from the descending right hand bank from an area approximately 200-300 m downstream of the existing bridge. This is also the area where approximately 55% (108 of 188 individuals) of the total mussels were found. Dimensions of the fat pocketbook individuals are presented in Table 2.

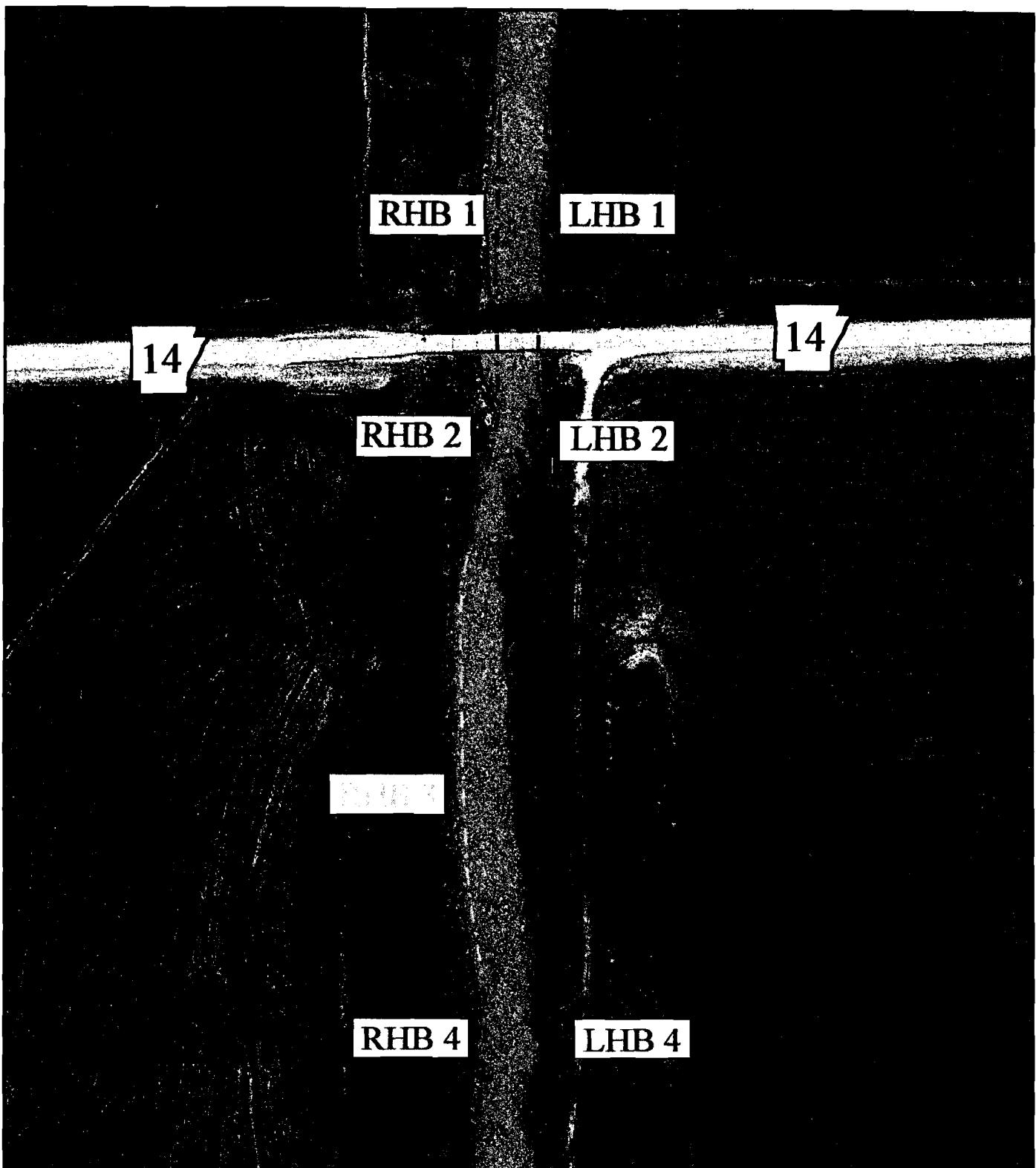


Figure 2  
Ditch 10 Survey Areas  
Poinsett County

RHB = Right Hand Bank  
LHB = Left Hand Bank

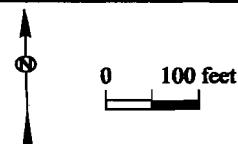


Table 1. Survey Results.

Species	LHB 1	RHB 1	LHB 2	RHB 2	RHB 3	LHB 4	RHB 4	Total	% Total
<i>Amblema plicata</i>	7	0	1	1	5	6	2	22	11.7
<i>Lampsilis cardium</i>	1	0	1	0	1	0	0	3	1.6
<i>Lampsilis teres</i>	1	0	0	5	0	0	0	6	3.2
<i>Lasmigona complanata</i>	2	1	2	0	3	5	0	13	6.9
<i>Leptodea fragilis</i>	3	1	1	0	5	0	1	11	5.9
<i>Obliquaria reflexa</i>	1	0	1	0	1	0	2	5	2.7
<i>Potamilus capax</i>	0	0	0	0	3	0	0	3	1.6
<i>Potamilus ohiensis</i>	0	1	0	1	0	1	0	3	1.6
<i>Potamilus purpuratus</i>	1	0	1	0	5	1	0	8	4.3
<i>Pyganodon grandis</i>	0	0	1	0	0	1	0	2	1.1
<i>Quadrula nodulata</i>	5	0	2	0	41	9	1	58	30.9
<i>Quadrula pustulosa</i>	0	0	2	0	0	0	0	2	1.1
<i>Quadrula quadrula</i>	3	0	2	0	37	7	0	49	26.1
<i>Toxolasma parvus</i>	0	0	0	0	2	1	0	3	1.6
Total	24	3	14	7	103	31	6	188	100.3

Table 2. Length, width and depth (in mm) dimensions for *Potamilus capax*.

Length	Width	Depth	Location	Specimen
126.3	76.1	92.0	RHB 3	14-1
108.9	63.1	80.4	RHB 3	14-2
26.1	14.5	18.6	RHB-3	14-3

### Discussion

The AHTD estimates the area of potential effect will encompass approximately 1000 m<sup>2</sup> of *P. capax* habitat. This includes stream lengths of 30 m upstream of the existing bridge, 40 m within the construction zone for the new permanent bridge and the temporary detour bridge, and 100 m downstream of the construction zone. The area of impact was calculated using two 3.0-meter wide areas along each thalweg that contained mussels. The downstream extent of the area of potential effect will be minimized by implementing special provisions for water pollution control (Appendix C).

Three specimens of *Potamilus capax* were recovered from seven search areas within and downstream of the area of potential impact. The total search area was approximately 1600 m<sup>2</sup>. The AHTD estimates that <10 *P. capax* reside within the potential area of impact.

The AHTD proposes to relocate individuals of *P. capax* from the potential area of effect discussed above. The proposed relocation site will be determined in coordination with the FWS. The specific relocation site will be assessed at the time of the relocation effort, and the site will have similar physical characteristics to the potential area of effect. In addition, the relocation site will have resident mussels similar in species composition to those present at the area of potential effect. The AHTD will request concurrence from the FWS regarding the relocation site prior to moving *P. capax* individuals.

### Literature Cited

Ahlstedt, S. A. and J. J. Jenkinson. 1991. Distribution and abundance of *Potamilus capax* and other freshwater mussels in the St. Francis River System, Arkansas and Missouri, U.S.A. Walkerana 5(14):225-261.

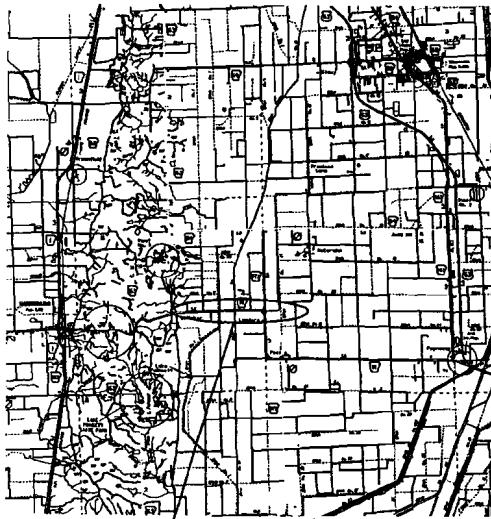
Turgeon, D. D., J. F. Quinn, Jr., A. E. Bogan, E. V. Coan, F. G. Hochberg, W. G. Lyons, P. M. Mikkelsen, C. F. E. Roper, G. Rosenberg, B. Roth, A. Scheltema, M. J. Sweeney, F. G. Thompson, M. Vecchione, and J. D. Williams. 1998. Common and scientific names of aquatic invertebrates from the United States and Canada: Mollusks. 2<sup>nd</sup> ed. American Fisheries Society Special Publication No. 26. Bethesda, Maryland. 526 pp.

**APPENDIX A**  
**PROPOSED CONSTRUCTION PLANS**

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
CONSTRUCTION PLANS FOR STATE HIGHWAY

DATE RECEIVED	FILE NUMBER	DATE ENTERED	DATE FILED	ED. AND DIST. NO.	STATE	PUBLIC PUBLICATION NUMBER	SHRINK INCHES	TOTAL SHEET
				6	ARK.	10038I		1

(2) DITCH NO.10 STR. & APPRS.(S)

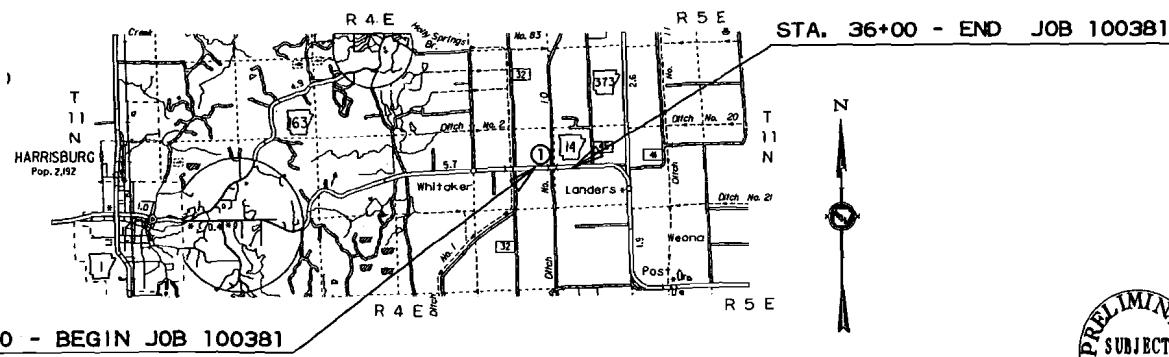


PROJECT  
LOCATION

VICINITY MAP

BRIDGE CONSTRUCTION DATA

- BR. END STA. 26+20.92  
BRIDGE NO.  
① 226'-0" CONT. COMP W-BEAM UNIT (71'-84'-71')  
40'-0" CLEAR ROADWAY  
228'-2" TOTAL LENGTH  
BR. END STA. 28+49.08

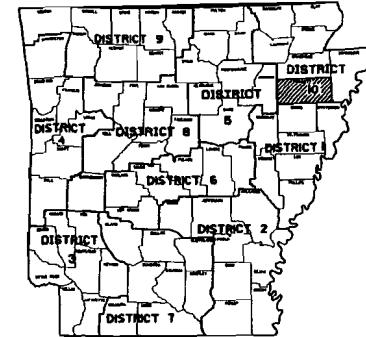


04/19/02 10038L11

MID-POINT OF PROJECT  
LAT. = N 35°34'11"  
LONG. = W 90°37'31"

GROSS LENGTH OF PROJECT	1700.00	FEET	OR	0.322	MILES
NET " " BRIDGES	226.16	"	"	0.043	"
NET " " ROADWAY	1471.84	"	"	0.279	"
NET " " PROJECT	1700.00	"	"	0.322	"

P.E. JOB 10038I  
PART.



ARK. HWY. DIST. NO. 10

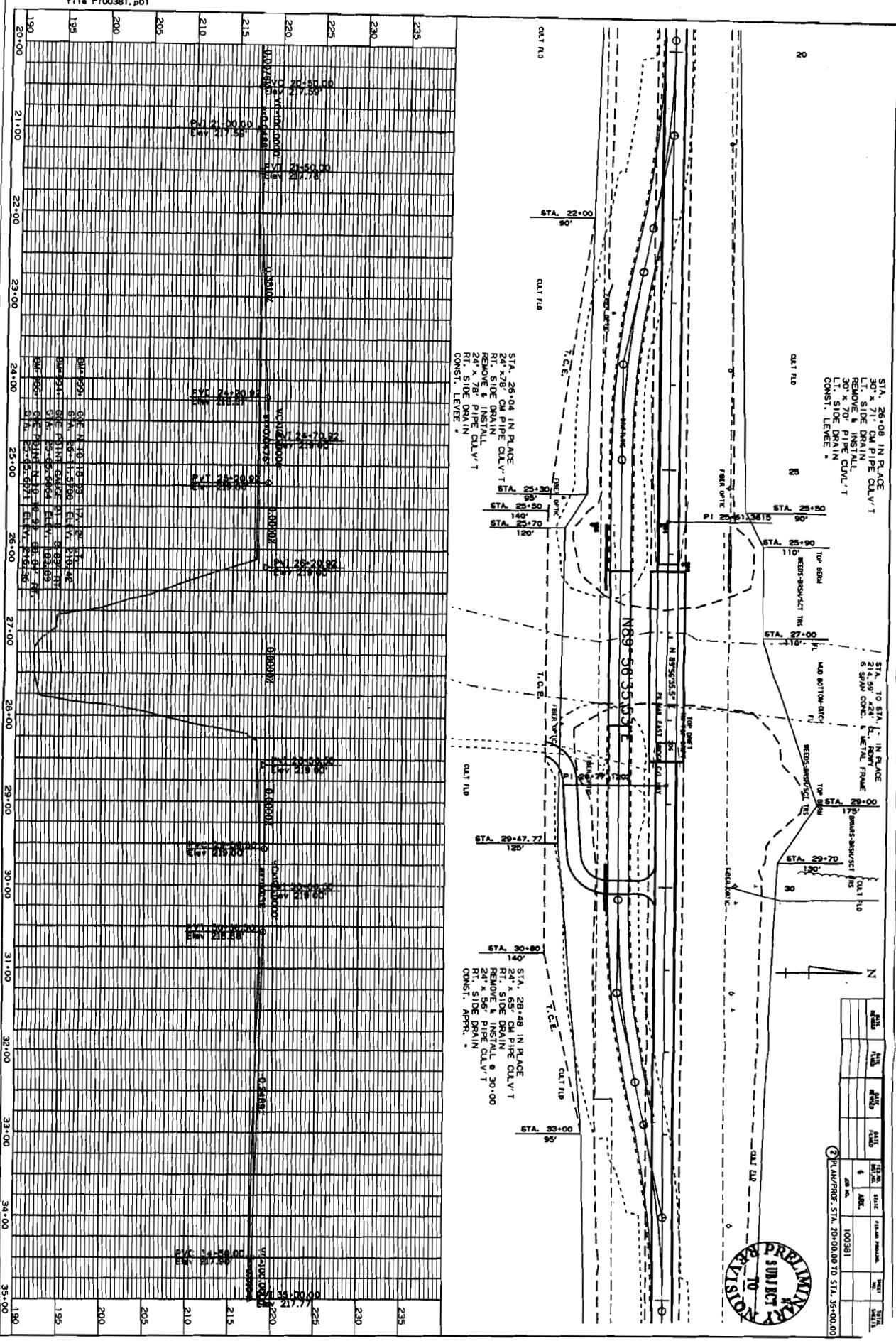
DESIGN TRAFFIC DATA

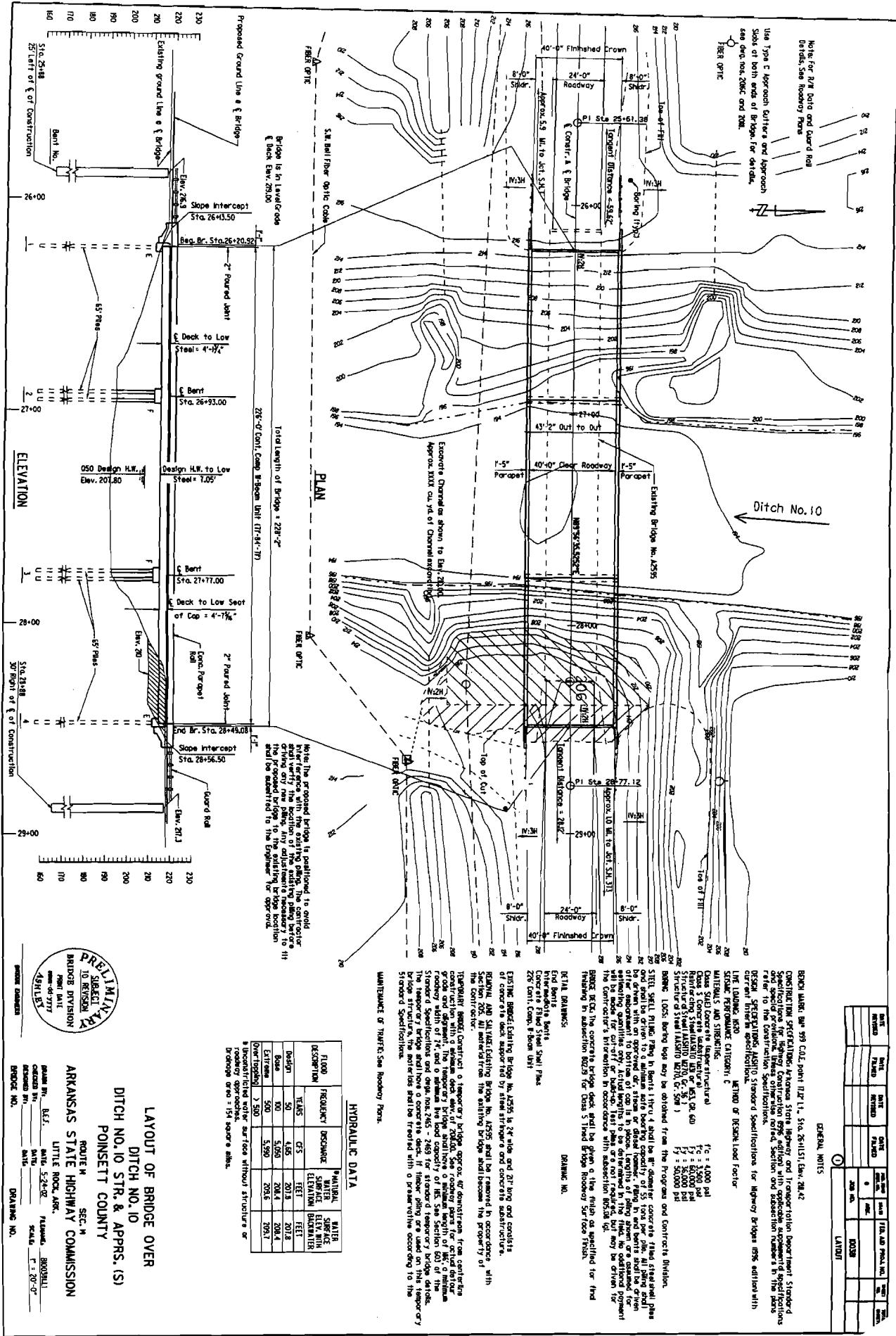
DESIGN YEAR	-	2022
2002 ADT	-	2500
2022 ADT	-	3275
2022 OHV	-	360
DIRECTIONAL DISTRIBUTION	-	60%
TRUCKS	-	%
DESIGN SPEED	-	60

PRELIMINARY  
SUBJECT  
TO  
REVISION

04/19/02 10038L11

file r100381.p01





DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	PUB. NO.	NAME	PUB. AD. PULL NO.	SHR. NO.
				8	ANL		
				JUN 01	10038		

① LAYOUT

### BORING LEGEND

A=Moist, Dense, Brown Spprc, Cobbles and Gravel with some Clay Seams (Fill Material)  
 B=Silty, Very Stiff, Brown Silt Clay  
 C=Moist, Soft, Gray Sand with some Shy Clay  
 D=Moist, Loose, Gray Sand with Clay Seams  
 E=Moist, Medium Dense, Gray Sand  
 F=Moist, Dense, Gray Sand with Traces of Gravel  
 G=Moist, Dense, Gray Sand  
 H=Moist, Medium Dense, Gray Sand with Traces of Organic Matter  
 I=Moist, Medium Dense, Gray and Black Lignite Sand  
 K=Moist, Medium Dense, Gray Sand with Traces of Gravel  
 L=Moist, Dense, Gray Sand with Traces of Gravel  
 M=Moist, Dense, Gray Sand with Traces of Gravel and Organic Matter  
 N=Moist, Loose, Brown Sand and Gravel  
 P=Moist, Stiff, Brown and Gray Clay with some Sand  
 Q=Moist, Medium Stiff, Brown Sandy Clay  
 R=Moist, Medium Dense, Brown Sand  
 S=Moist, Medium Dense, Gray Sand with some Organic Matter  
 T=Moist, Dense, Gray Sand with Traces of Organic Matter and Clay  
 U=Moist, Dense, Gray Sand with Organic Matter  
 V=Moist, Very Dense, Gray Sand

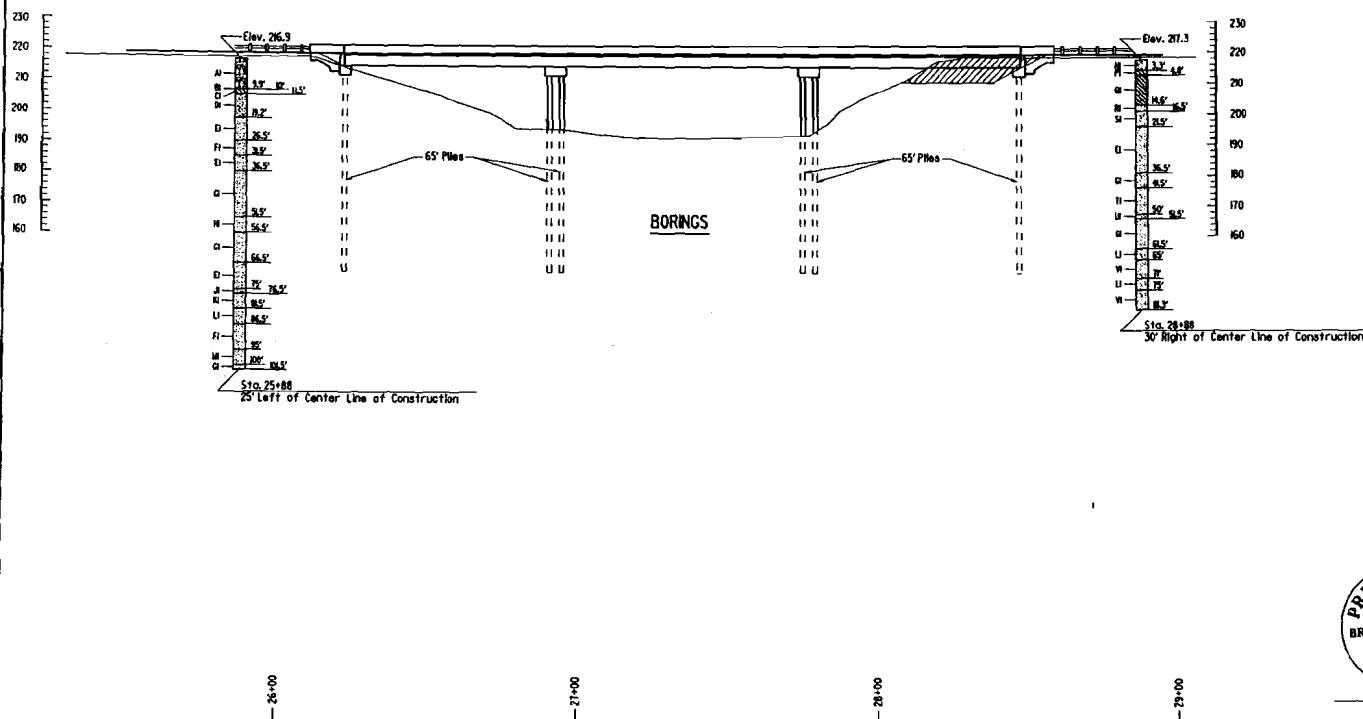
### "N" VALUES

#### Sta. 25+88 - 25' Left of Center Line of Construction

10.5 - 11.5, N=1  
 15.5 - 16.5, N=2  
 20.5 - 21.5, N=18  
 25.5 - 26.5, N=20  
 30.5 - 31.5, N=32  
 35.5 - 36.5, N=28  
 40.5 - 41.5, N=32  
 45.5 - 46.5, N=37  
 50.5 - 51.5, N=35  
 55.5 - 56.5, N=20  
 60.5 - 61.5, N=1  
 65.5 - 66.5, N=48  
 70.5 - 71.5, N=30  
 75.5 - 76.5, N=18  
 80.5 - 81.5, N=29  
 85.5 - 86.5, N=64  
 90.5 - 91.5, N=42  
 95.5 - 96.5, N=47  
 100.5-101.5, N=43

#### Sta. 28+88 - 30' Right of Center Line of Construction

3.8 - 4.8, N=9  
 8.8 - 9.8, N=7  
 15.5 - 16.5, N=21  
 20.5 - 21.5, N=26  
 25.5 - 26.5, N=28  
 30.5 - 31.5, N=38  
 35.5 - 36.5, N=28  
 40.5 - 41.5, N=31  
 45.5 - 46.5, N=43  
 50.5 - 51.5, N=33  
 55.5 - 56.5, N=46  
 60.5 - 61.5, N=41  
 65.5 - 66.5, N=66  
 70.5 - 71.5, N=29 (0.5')  
 75.5 - 76.5, N=57  
 80.5 - B1.3, N=99 (0.8')  
 80.5 - B1.3, N=99 (0.8')



SHEET 2 OF 2  
 LAYOUT OF BRIDGE OVER  
 DITCH NO. 10  
 DITCH NO. 10 STR. & APPRS. (S)  
 POINSETT COUNTY



ROUTE N SEC. N  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.  
 DRAWN BY: B.E.F. DATE: 06-22-02 FILENAME: 010038LI  
 CHECKED BY: DATE: SCALE: No Scale  
 DESIGNED BY: DATE:  
 BRIDGE NO. DRAWING NO.

**APPENDIX B**  
**SURVEY FIELD NOTES**

## Arkansas Freshwater Bivalves Field Data Sheet

Site Hwy 14 - 1

Date 22 August 2002

County Poinsett

Quad

Drainage St. Francis

Substrate silt/sand &amp; clay

Width 20-30m

9:30

Location Ditch 10 at AR Hwy 14 x-ways

RHB RHB

RHB RHB 10:45

LHB	Live	Dead	LHB	Live	Dead
<i>Actinonaias ligamentina</i>			<i>Obovaria jacksoniana</i>		
<i>Alasmidonta marginata</i>			<i>Obovaria olivaria</i>		
<i>Alasmidonta viridis</i>			<i>Plectomerus dombeyanus</i>		
<i>Amblema plicata</i>	7		<i>Pleurobema coccineum</i>		
<i>Anodonta suborbiculata</i>			<i>Pleurobema cordatum</i>		
<i>Anodontoides ferussacianus</i>			<i>Pleurobema pyramidatum</i>		
<i>Arcidens confragosus</i>			<i>Potamilus alatus</i>		
<i>Arkansas wheeleri</i>			<i>Potamilus capax</i>		1
<i>Cyclonaias tuberculata</i>			<i>Potamilus ohiensis</i>	1	1
<i>Cyprogenia aberti</i>			<i>Potamilus purpuratus</i>	1	
<i>Cumberlandia monodonta</i>			<i>Ptychobranchus occidentalis</i>		
<i>Ellipsaria lineolata</i>			<i>Pyganodon grandis</i>		1
<i>Elliptio dilatata</i>			<i>Quadrula apiculata</i>		
<i>Epioblasma curtisi</i>			<i>Quadrula cylindrica</i>		
<i>Epioblasma triquetra</i>			<i>Quadrula fragosa</i>		
<i>Epioblasma turgidula</i>			<i>Quadrula metanevra</i>		
<i>Fusconaia ebena</i>			<i>Quadrula nodulata</i>	5	
<i>Fusconaia flava</i>			<i>Quadrula pustulosa</i>		
<i>Fusconaia ozarkensis</i>			<i>Quadrula quadrula</i>	3	1
<i>Lampsilis abrupta</i>			<i>Simpsonaias ambigua</i>		
<i>Lampsilis cardium</i>	1		<i>Strophitus undulatus</i>		
<i>Lampsilis hydiana</i>			<i>Toxolasma lividus</i>		
<i>Lampsilis ornata</i>			<i>Toxolasma parvus</i>		
<i>Lampsilis powelli</i>			<i>Toxolasma texassensis</i>		
<i>Lampsilis rafinesqueana</i>			<i>Tritogonia verrucosa</i>		
<i>Lampsilis reeveiana</i>			<i>Truncilla donaciformis</i>		
<i>Lampsilis satura</i>			<i>Truncilla truncata</i>		
<i>Lampsilis siliquoidea</i>			<i>Uniomerus declivus</i>		
<i>Lampsilis streckeri</i>			<i>Uniomerus tetralasmus</i>		
<i>Lampsilis teres</i>	1	4	<i>Utterbackia imbecillis</i>		
<i>Lasmigona costata</i>			<i>Venustaconcha ellipsiformis</i>		
<i>Lasmigona complanata</i>	2	1	<i>Venustaconcha pleasi</i>		
<i>Leptodea fragilis</i>	3	1	<i>Villosa arkansensis</i>		
<i>Leptodea leptodon</i>			<i>Villosa iris</i>		
<i>Ligumia recta</i>			<i>Villosa lienosa</i>		
<i>Ligumia subrostrata</i>			<i>Corbicula fluminea</i>	4	
<i>Megalonaia nervosa</i>			<i>Dreissena polymorpha</i>		
<i>Obliquaria reflexa</i>	1	1			

B. Barley, J. Harris 100m upstream of bridge to bridge.

Barley = RHB, JH = LHB. 0930 - 1045.

2m wide search - thalweg - both sides.

Arkansas Freshwater Bivalves Field Data Sheet

Site Hwy 14-2

Date 22 August 2002

County Poinsett

Quad

11:15

Drainage St. Francis

Substrate silt/sand, clay, gravel

large

Width

20-30m

12:30

Location Hwy 14 Bridge at Ditch rd.

	LHR	RHB	RHB		LHB	RHB	RHB
	LIVE	Live	Dead		LIVE	Live	Dead
<i>Actinonaias ligamentina</i>				<i>Obovaria jacksoniana</i>			
<i>Alasmidonta marginata</i>				<i>Obovaria olivaria</i>			
<i>Alasmidonta viridis</i>				<i>Plectomerus dombeyanus</i>			
<i>Amblema plicata</i>	1	1		<i>Pleurobema coccineum</i>			
<i>Anodonta suborbiculata</i>				<i>Pleurobema cordatum</i>			
<i>Anodontoides ferussacianus</i>				<i>Pleurobema pyramidatum</i>			
<i>Arcidens confragosus</i>				<i>Potamilus alatus</i>			
<i>Arkansas wheeleri</i>				<i>Potamilus capax</i>			
<i>Cyclonaias tuberculata</i>				<i>Potamilus ohiensis</i>	1	1	
<i>Cyprogenia aberti</i>				<i>Potamilus purpuratus</i>	1		
<i>Cumberlandia monodonta</i>				<i>Ptychobranchus occidentalis</i>			
<i>Ellipsaria lineolata</i>				<i>Pyganodon grandis</i>	1		
<i>Elliptio dilatata</i>				<i>Quadrula apiculata</i>			
<i>Epioblasma curtisi</i>				<i>Quadrula cylindrica</i>			
<i>Epioblasma triquetra</i>				<i>Quadrula fragosa</i>			
<i>Epioblasma turgidula</i>				<i>Quadrula metanevra</i>			
<i>Fusconaia ebena</i>				<i>Quadrula nodulata</i>	2		
<i>Fusconaia flava</i>				<i>Quadrula pustulosa</i>	2		
<i>Fusconaia ozarkensis</i>				<i>Quadrula quadrula</i>	2		
<i>Lampsilis abrupta</i>				<i>Simpsonaias ambigua</i>			
<i>Lampsilis cardium</i>	1			<i>Strophitus undulatus</i>			
<i>Lampsilis hydiana</i>				<i>Toxolasma lividus</i>			
<i>Lampsilis ornata</i>				<i>Toxolasma parvus</i>			
<i>Lampsilis powelli</i>				<i>Toxolasma texensis</i>			
<i>Lampsilis rafinesqueana</i>				<i>Tritogonia verrucosa</i>			
<i>Lampsilis reeveiana</i>				<i>Truncilla donaciformis</i>			
<i>Lampsilis sativa</i>				<i>Truncilla truncata</i>			
<i>Lampsilis siliquoidea</i>				<i>Uniomerus declivus</i>			
<i>Lampsilis streckeri</i>				<i>Uniomerus tetralasmus</i>			
<i>Lampsilis teres</i>	5	2		<i>Utterbackia imbecillis</i>			
<i>Lasmigona costata</i>	2			<i>Venustaconcha ellipsiformis</i>			
<i>Lasmigona complanata</i>	2			<i>Venustaconcha pleasi</i>			
<i>Leptodea fragilis</i>	1		1	<i>Villosa arkansensis</i>			
<i>Leptodea leptodon</i>				<i>Villosa iris</i>			
<i>Ligumia recta</i>				<i>Villosa lienosa</i>			
<i>Ligumia subrostrata</i>				<i>Corbicula fluminea</i>			
<i>Megalonaia nervosa</i>				<i>Dreissena polymorpha</i>			
<i>Obliquaria reflexa</i>	1						

B. Barley, J. Harry - Bridge to approx. 100 m downstream.

Barley RHB, JH on LAB. 11:15-12:30. 2m wide search - thalweg

both sides - Seam of scattered large gravel / not solid / from just below bridge - extends about 30m.

11:15  
12:30  
L4D  
DEAD

## Arkansas Freshwater Bivalves Field Data Sheet

Site Hwy 14-3

Date 22 August 2002

County Poinsett

Quad

1:00

Drainage St. Francis

Substrate silt/sand &amp; clay

Width

20-30m

1

Location Ditch 10 at AR Hwy 14.

2:15

RHB

RHB

	Live	Dead		Live	Dead
<i>Actinonaias ligamentina</i>			<i>Obovaria jacksoniana</i>		
<i>Alasmidonta marginata</i>			<i>Obovaria olivaria</i>		
<i>Alasmidonta viridis</i>			<i>Plectomerus dombeyanus</i>		
<i>Amblema plicata</i>	5		<i>Pleurobema coccineum</i>		
<i>Anodontia suborbiculata</i>			<i>Pleurobema cordatum</i>		
<i>Anodontoides ferussacianus</i>			<i>Pleurobema pyramidatum</i>		
<i>Arcidens confragosus</i>			<i>Potamilus alatus</i>		
<i>Arkansas wheeleri</i>			<i>Potamilus capax</i>	3	
<i>Cyclonaia tuberculata</i>			<i>Potamilus ohiensis</i>		
<i>Cyprogenia aberti</i>			<i>Potamilus purpuratus</i>	5	
<i>Cumberlandia monodonta</i>			<i>Ptychobranchus occidentalis</i>		
<i>Ellipsaria lineolata</i>			<i>Pyganodon grandis</i>		
<i>Elliptio dilatata</i>			<i>Quadrula apiculata</i>		
<i>Epioblasma curtisi</i>			<i>Quadrula cylindrica</i>		
<i>Epioblasma triquetra</i>			<i>Quadrula fragosa</i>		
<i>Epioblasma turgidula</i>			<i>Quadrula metanevra</i>		
<i>Fusconaia ebena</i>			<i>Quadrula nodulata</i>	41	
<i>Fusconaia flava</i>			<i>Quadrula pustulosa</i>		
<i>Fusconaia ozarkensis</i>			<i>Quadrula quadrula</i>	37	
<i>Lampsilis abrupta</i>			<i>Simpsonaias ambigua</i>		
<i>Lampsilis cardium</i>	1		<i>Strophitus undulatus</i>		
<i>Lampsilis hydiana</i>			<i>Toxolasma lividus</i>		
<i>Lampsilis ornata</i>			<i>Toxolasma parvus</i>	2	1
<i>Lampsilis powelli</i>			<i>Toxolasma texassensis</i>		
<i>Lampsilis rafinesqueana</i>			<i>Tritogonia verrucosa</i>		
<i>Lampsilis reeveiana</i>			<i>Truncilla donaciformis</i>		
<i>Lampsilis satula</i>			<i>Truncilla truncata</i>		
<i>Lampsilis siliquoidea</i>			<i>Uniomerus declivus</i>		
<i>Lampsilis streckeri</i>			<i>Uniomerus tetralasmus</i>		
<i>Lampsilis teres</i>			<i>Utterbackia imbecillis</i>		
<i>Lasmigona costata</i>			<i>Venustaconcha ellipsiformis</i>		
<i>Lasmigona complanata</i>	3		<i>Venustaconcha pleasi</i>		
<i>Leptodea fragilis</i>	5		<i>Villosa arkansensis</i>		
<i>Leptodea leptodon</i>			<i>Villosa iris</i>		
<i>Ligumia recta</i>			<i>Villosa lienosa</i>		
<i>Ligumia subrostrata</i>			<i>Corbicula fluminea</i>		
<i>Megalonaia nervosa</i>			<i>Dreissena polymorpha</i>		
<i>Obliquaria reflexa</i>	1				

SPECIMAN 14-1 L = 126.3 D = 92.0 W = 76.1 1300 - 1415 hrs.

14-2 L = 108.9 D = 80.4 W = 63.1

14-3 L = 26.1 D = 18.6 W = 14.5

Harris, Barley - both on RHB - too shallow to support much on LHB  
 from about 100m DS of bridge to 300m DS of bridge.

Site Hwy 14-4

Date 22 August 2002 County Poinsett Quad   
 Drainage St Francis Substrate Silt/sand & clay Width 20-30m  
 Location

	LH3	RHB	LH3	RHB	i2H3	LH3
<i>Actinonaias ligamentina</i>			<i>Obovaria jacksoniana</i>			
<i>Alasmidonta marginata</i>			<i>Obovaria olivaria</i>			
<i>Alasmidonta viridis</i>			<i>Plectomerus dombeyanus</i>			
<i>Amblema plicata</i>	60	2	<i>Pleurobema coccineum</i>			
<i>Anodontia suborbiculata</i>			<i>Pleurobema cordatum</i>			
<i>Anodontoides ferussacianus</i>			<i>Pleurobema pyramidatum</i>			
<i>Arcidens confragosus</i>			<i>Potamilus alatus</i>			
<i>Arkansas wheeleri</i>			<i>Potamilus capax</i>			
<i>Cyclonaia tuberculata</i>			<i>Potamilus ohiensis</i>	1		
<i>Cyprogenia aberti</i>			<i>Potamilus purpuratus</i>	1		
<i>Cumberlandia monodonta</i>			<i>Ptychobranchus occidentalis</i>			
<i>Ellipsaria lineolata</i>			<i>Pyganodon grandis</i>	1		
<i>Elliptio dilatata</i>			<i>Quadrula apiculata</i>			
<i>Epioblasma curtisi</i>			<i>Quadrula cylindrica</i>			
<i>Epioblasma triquetra</i>			<i>Quadrula fragosa</i>			
<i>Epioblasma turgidula</i>			<i>Quadrula metanevra</i>			
<i>Fusconaia ebena</i>			<i>Quadrula nodulata</i>	9	1	
<i>Fusconaia flava</i>			<i>Quadrula pustulosa</i>			
<i>Fusconaia ozarkensis</i>			<i>Quadrula quadrula</i>	7		
<i>Lampsilis abrupta</i>			<i>Simpsonaias ambigua</i>			
<i>Lampsilis cardium</i>			<i>Strophitus undulatus</i>			
<i>Lampsilis hydiana</i>			<i>Toxolasma lividus</i>			
<i>Lampsilis ornata</i>			<i>Toxolasma parvus</i>	1		
<i>Lampsilis powelli</i>			<i>Toxolasma texensis</i>			
<i>Lampsilis rafinesqueana</i>			<i>Tritogonia verrucosa</i>			
<i>Lampsilis reeveiana</i>			<i>Truncilla donaciformis</i>			
<i>Lampsilis satura</i>			<i>Truncilla truncata</i>			
<i>Lampsilis siliquoidea</i>			<i>Uniomerus declivus</i>			
<i>Lampsilis streckeri</i>			<i>Uniomerus tetralasmus</i>			
<i>Lampsilis teres</i>			<i>Utterbackia imbecillis</i>			
<i>Lasmigona costata</i>			<i>Venustaconcha ellipsiformis</i>			
<i>Lasmigona complanata</i>	5		<i>Venustaconcha pleasi</i>			
<i>Leptodea fragilis</i>	1		<i>Villosa arkansensis</i>			
<i>Leptodea leptodon</i>			<i>Villosa iris</i>			
<i>Ligumia recta</i>			<i>Villosa lienosa</i>			
<i>Ligumia subrostrata</i>			<i>Corbicula fluminea</i>			
<i>Megalonaia nervosa</i>			<i>Dreissena polymorpha</i>			
<i>Obliquaria reflexa</i>	2					

B. Bailey on RHB / Jut on LH3. Shorter length - maybe 50m long  
 from 300m down to 350m below bridge - down to 1st Sycamore  
 on LH3.

**APPENDIX C**  
**SPECIAL PROVISIONS FOR WATER POLLUTION CONTROL**

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT****SPECIAL PROVISION**

JOB NO. 100381

**PRELIMINARY**  
WATER POLLUTION CONTROL SUBJECT TO REVISION

**Section 110** of the Standard Specifications for Highway Construction, Edition of 1996 is hereby amended as follows:

The following is added to **Section 110**:

Sedimentation, turbidity, and other water pollution on this project shall be carefully controlled and minimized due to the proximity of the *Potamilus capax* (Fat Pocketbook Mussel), a species Federally listed as Threatened or Endangered. The Contractor shall, in all operations, including removal and disposal of the existing bridge structure and construction of the new structure, make provisions to minimize any material or debris resulting from work performed on this project entering the waterway. Required actions of the Contractor shall include, but are not limited to, the following:

- Demolition of the existing bridge shall be accomplished in such a manner that turbidity and sedimentation are minimized. No blasting shall be allowed. The method of demolition and removal shall be approved by the Engineer.
- Cofferdams constructed of steel sheet pile shall be utilized within the stream channel to prevent excavation in the water. Excavation shall be performed in a manner, which prevents the excavated material from entering the water.
- Materials excavated during bridge construction and removal of existing roadway embankment shall not be stockpiled between Station 26+00 to Station 29+00 unless the material is clean gravel to be used for backfilling around the piers in the streambed in accordance with Subsection 801.08. Excess excavated material shall be disposed of in accordance with the standard specifications. No material shall be wasted or temporarily stockpiled in wetlands or where it can be eroded or washed into waters of the United States.
- Material for work roads or pads shall be free from toxic pollutants in harmful amounts. All temporary fill placed within 8 meters (25 feet) of the channel banks of Ditch No. 10 shall be constructed using a riprap of the size specified in subsection 816.02 (a)(2), or larger material. This includes channelized streams and relief channels. A minimal amount of clean stone or gravel may be placed on top of the temporary fill in order to obtain a smooth working surface. The clean stone or gravel utilized shall have less than twelve percent passing the 0.075 mm (# 200) sieve. Upon removal, salvaged material that meets the

requirements of subsection 816.02 will be paid for when reused in areas, which require the utilization of riprap.

- Water pumped from excavated footings and cofferdams shall be diverted into a sediment basin (Type E-9) or other device as approved by the Engineer. This sediment basin or device shall be of a holding capacity approved by the Engineer.

- The Engineer reserves the right to limit the storage of any material shall within the floodplain to preclude the possibility of an unlawful discharge to the stream. No storage of waste materials, trash, etc., shall be allowed. The Engineer has the authority to limit the amount of petroleum and other chemical products allowed into work areas adjacent to waterways/wetlands at any one time. Storage of these materials shall not be allowed within 100 feet of Ditch No. 10. Construction of berms, or other similar measures, may be required for storage/refueling areas as a best management practice to restrict spill areas. Limited amounts of petroleum products, as determined by the Engineer, shall be allowed at any one time into work areas adjacent to wetlands, waterbodies, and other sensitive areas. This includes, but is not limited to, petroleum products required for fueling and servicing equipment.

- Fording of the river shall not be allowed.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT:** The work involved in complying with this Special Provision, including sediment basins, will not be measured or paid for separately, but will be considered included in the contract unit prices bid for other items of the contract.