

Approved: 2-27-98
Date

MINUTES OF THE HOUSE COMMITTEE ON ENVIRONMENT.

The meeting was called to order by Vice-Chairperson Joann Freeborn at 3:30 p.m. on February 5, 1998 in Room 526-S of the Capitol.

All members were present except: Rep. Steve Lloyd - excused
Rep. Kent Glasscock - excused

Committee staff present: Raney Gilliland, Legislative Research Department
Hank Avila, Legislative Research Department
Mary Torrence, Revisor of Statutes
Mary Ann Graham, Committee Secretary

Conferees appearing before the committee: Lee Gerhard, PhD, Geologist and Director, KS Geological Survey, 1930 Constant Ave., Lawrence, KS, 66047-3726

James R. McCauley, Geologist, Geologic Investigations, KS Geological Survey, 1930 Constant Ave., Lawrence, KS, 66047-3726

James T. Janousek, Manager Research & Analysis, KS Dept. of Commerce & Housing, 700 SW Harrison, Ste. 1300, Topeka, KS, 66603-3712

Cathy Tucker-Vogal, KS Water Office, 109 SW 9th, Ste. 300, Topeka, KS, 66612-1249

Roger Wolfe, Fisheries/Wildlife Supervisor, KS Dept. Wildlife & Parks, 3300 SW 29th, Topeka, KS, 66614

Paul Liechti, Assistant Director, KS Biological Survey, KS Biological Survey, University of Kansas, Foley Hall, 2041 Constant Ave., Lawrence, KS, 66047-2906

Edward Martinko, State Biologist & Director, KS Biological Survey, University of Kansas, Foley Hall, 2041 Constant Ave., Lawrence, KS, 66047-2906

Others attending: See attached list

Chairperson Joann Freeborn called the meeting to order at 3:30 p.m. She thanked the people that are appearing today for taking the time to inform the committee on water issues, the Kansas River Studies.

The Chairperson welcomed Lee Gerhard, Director, KS Geological Survey. He addressed the committee and gave a brief summary of the Kansas River Corridor report. He introduced members of the KS Geological Survey, James R. McCauley, Geologist, Geologic Investigations, who will be briefing the committee today on the report. Also Lawrence Brady, editor of the report and David Grisafe, one of the contributing authors. He introduced William Harrison, the new deputy director of the Geological Survey.

The Chairperson welcomed James R. McCauley, Geologist, Geologic Investigations. He briefed the committee on "The Kansas River Corridor, Its Geologic Setting, Land Use, Economic Geology, and Hydrology" report. (See attachment 1) (The full report can be seen in the Legislative Research Department). Attempts to eliminate or restrict the Kansas river as a source of economic minerals prompted the study of the river. The objective of the study is to provide a better understanding of the Kansas river as a geologic resource by discussing the physical and cultural geography of the river valley, the geologic setting, the river's hydraulics and sedimentary load and the economic minerals associated with the river, especially sand and

CONTINUATION SHEET

MINUTES OF THE HOUSE COMMITTEE ON ENVIRONMENT, Room 526-S Statehouse, at 3:30 p.m. on February 5, 1998.

gravel. Questions followed.

Chairperson Freeborn welcomed James T. Janousek, Manager of Research and Analysis, KS Department of Commerce and Housing. Mr. Janousek gave a summary of the "Kansas River Recreation Study". (See attachment 2) (The full report can be seen in the Legislative Research Department). This study has been performed in compliance with legislation passed by the 1996 Kansas Legislature in section 78 of SB757. The legislature directed that Kansas Department of Commerce and Housing in conjunction with the Kansas Water Office, KS Geological Survey, KS Biological Survey and the KS Department of Wildlife and Parks; conduct a study of the development of recreational opportunities within the Kansas river. Issues identified in the study were related to the development of recreational activities on the river. The assessment of economic potential for river recreation and the degree of compatibility of recreational and commercial use of the river were also concerns of the study group. The study team have identified a list of six recommendations that are presented to the legislature for action. (See page 5, attachment 2)

The Chairperson welcomed Cathy Tucker-Vogal, from the Kansas Water Office, to the committee. The Kansas Water Office fully endorses the six recommendations put forth in the Kansas River Recreation Study report and provided additional comments related to recommendations 2, 3, and 6. (See attachment 3)

Roger Wolfe, Department of Wildlife and Parks was welcomed to the committee. The KDWP supports providing additional recreational opportunities to the Kaw since it is a public river. KDWP supports the concept of requiring a "Recreational Compatibility Plan" for future permit requests and supports setting aside certain sections of the river for recreational use that will not be impacted by dredging activities in the future while allowing dredging operations to continue and expand in other sections of the river. KDWP is in support of enhancing the facilities needed for access to the Kansas river within funding limits and supports the use of state Water Plan Funds to develop facilities for recreational access to the river. (See attachment 4) Questions followed.

The Chairperson welcomed Edward Martinko, KS Biological Survey. He gave some background information on the functions of the Survey and introduced Jerry deNoyelles, Associate Director, KS Biological Survey, who was in attendance today. He introduced Paul Liechi, Assistant Director of the Survey.

Chairperson Freeborn welcomed Paul Liechi to the committee. The Biological Survey believes that the recommendations developed by the study team are reasonable and if thoughtfully acted upon, would be a positive step toward development of the Kansas river as a viable recreational resource. However, they have a few brief comments about recommendations 3 and 6. (See attachment 5) Questions followed. Secretary Steve Williams, KS Department Wildlife and Parks offered comments concerning the permitting process for dredging.

Chairperson Freeborn thanked the guests for their presentations.

The meeting adjourned at 5:15 p.m.

The next meeting is scheduled for February 9, 1998.

HOUSE ENVIRONMENT COMMITTEE COMMITTEE GUEST LIST

DATE: 2-5-98

NAME	REPRESENTING
Paul Liechti	Kansas Biological Survey
Jim Conroysek	Ks Dept. of Commerce + Housing
R. E. Belch	KRWAD #1
Jerry deNoijelles	Kansas Biological Survey
Ed Martinko	Kansas Biological Survey
SIM MCCAULEY	KANSAS GEOLOGICAL SURVEY
Lawrence L. Brady	Kansas Geol. Survey
David A. Grisafe	Kansas Geological Survey
Bill Harrison	Kansas Geological Survey
M. Skilled	Lawrence J. World
Les. Kulow	Kansas Biological Survey
Eric Suther	City of Topeka
Bob Groun	City of Topeka
Dwight Jackson	City of Topeka, IA
Steve Adams	KDWP
STEVE WILLIAMS	KDWP
Clint Riley	KDWP
Wendy Harms	KS Aggregate Producers' Assn.
Jean Barbu	Diocesan Districts

**The Kansas River Corridor, its Geologic Setting, Land Use,
Economic Geology, and Hydrology**

James R. McCauley, Kansas Geological Survey

House Committee on Environment

February 5, 1998

My name is Jim McCauley, and I am a geologist at the Kansas Geological Survey where I have worked for the last 21 years. The Kansas Geological Survey was established by the legislature at the University of Kansas in 1889 as a research and service organization with the expressed purpose of making, and I quote, "A complete geological survey of the state of Kansas, giving special attention to any and all natural products of economic importance." It is in fulfilling this mission that I am presenting this report to you today. The title of the report is: "The Kansas River Corridor, its geologic setting, land use, economic geology, and hydrology." It was edited by Lawrence L. Brady and the contributing authors, in addition to myself, are David Grisafe, Gregory Ohlmacher, Hernan Quinodoz, and Kenneth Nelson.

Attempts to eliminate or restrict the Kansas River as a source of economic minerals prompted this study of the river. The objective of this study is to provide a better understanding of the Kansas River as a geologic resource by discussing the physical and cultural geography of the river valley, the geologic setting, the river's hydraulics and sedimentary load and the economic minerals associated with the river, especially sand and gravel. The study focuses on a Kansas River corridor that

*House Environment
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Attachment 1*

we defined as that area within 6 miles of the river, from its source in Junction City to its mouth in Kansas City, an area of roughly 1,700 square miles.

The Kansas River is a major natural resource in northeast Kansas, in fact, it is many different resources. First of all, it is a transportation resource and is still classified as a navigable stream, although that is primarily a bureaucratic description rather than a practical one. Its river valley cuts through the Flint Hills and the Osage Cuestas and is to this day an important transportation corridor. The river is an important water resource, not only the river itself, but also its alluvial aquifer, which is the major aquifer in northeastern Kansas. The rich bottom lands of the river are an important agricultural resource. The Kansas River is the largest river in the state, and its riparian habitat represent an ecological resource. As one of three public water-ways in the state, the Kansas River is an important recreational resource. And since it is the source of industrial minerals, mainly sand and gravel, the Kansas River is an important mineral resource and this will be the major topic of my report today.

GEOGRAPHIC AND GEOLOGIC SETTING

The Kansas River officially begins in Junction City at the confluence of the Smoky Hill and Republican rivers. It flows 170 miles east to the Missouri River in Kansas City. The actual drainage area of the Kansas River extends 500 miles west from Kansas City onto the high plains in northeastern Colorado. The river drains an area of 60,000 square miles, an area larger than the state of Iowa. Major tributaries to the river include the Smoky Hill, the Saline, the Solomon, the Republican, and Big Blue Rivers, Soldier Creek, the Delaware River, Wakarusa

River, and Stranger Creek. All the large tributaries of the Kansas River are impounded by federal reservoirs and there are a total of 18 such reservoirs in the basin. The Kansas River itself is dammed at Lawrence by Bowersock Dam, a low hydro-electric dam.

The Kansas River flows near the southern limit of glacial advance into Kansas during the Pleistocene epoch, a period of time known informally as the Ice Ages which occurred fairly recently in geologic time. The Kansas glacier entered Kansas several hundred thousand years ago and played a major role in the formation and location of the Kansas River. Since that time, the Kansas River has been cutting into the underlying bedrock which dates to the Pennsylvanian and Permian periods of geologic time, and is 270 to 300 million years old. This bedrock is predominately limestone and shale with a few sandstones and thin coals interbedded. This bedrock forms the bluffs and the uplands that border the Kansas River. Scattered throughout the uplands are glacial drift deposits that include clay, silt, sand, gravel and even boulders, especially the large pink boulders so common to northeastern Kansas. The Kansas River is a dynamic fluvial system that transports sediments, erodes existing soil and rock, and creates new sedimentary deposits. Sediment is transported in the river in two ways: as bedload, which includes that material such as sand and gravel that bounces or rolls along the river bed, and suspended load, which is much finer material that is held in suspension by the river and only reaches the bottom in areas of slack water in which the river is not moving.

The Kansas River has been altering its valley and channel throughout its history. During times of high flow such as when the glaciers are melting, a lot of water and a lot of sediment moved down the river and allowed it to erode a deep channel and to widen it by lateral erosion. Since that time it has repeatedly filled this valley with sediment. When it does this, the river is said to be aggrading and the process is called aggradation. At other times, it has eroded these sediments from its valley. When it does this the river is said to be degrading and the process is called degradation. When I use the term degradation, I am only referring to the down cutting action of the river on its river bed, I am not making value judgments concerning the water quality or the state of the environment.

Today, the Kansas River has formed a deep bedrock trench that is partially filled up with silt, sand and gravel, material collectively known as alluvium. In places, this alluvium is up to 95 feet thick. The upper surface of this alluvium is referred to as the flood plain. Away from the river are slightly elevated portions of the flood plain that are known as terraces. These represent flood plain deposits that formed when the river flowed at higher levels. In general, the Kansas River is said to be at equilibrium or to be slightly degrading. A study done in 1984 estimated that roughly 1.67 million tons of sediment per year passed the DeSoto gauging station. Such measurements are made with a high degree of uncertainty. The 18 federal reservoirs in the Kansas River basin do two things: they control floods and they trap sediment. By reducing the size of floods along the Kansas River these reservoirs reduce the maximum grain size that can be transported by the river. As a

result, today, much of the gravel that is taken from this river cannot be replenished since it is only moved during very large floods.

The Kansas River valley is 138 miles long and has a gradient or slope of about two and a half feet per mile. The Kansas River takes a more tortuous course and is 170 miles long and has a gradient of about 2 feet per mile. The average width of the Kansas River flood plain is 2.6 miles. However, it is 3 miles or wider in numerous places above Eudora. The widest stretch of the flood plain is in the Wamego to Rossville area where it is equal to or slightly more than 4 miles in width. The narrowest stretch of the Kansas River is from Eudora to its mouth where it is less than a mile and a half in width and in some places less than a mile. From Junction City to Lawrence, the Kansas River seems to prefer the south side of its valley touching the south valley walls in numerous locations. Below Lawrence, the river shows no preference for either side of its valley and meanders from bluff to bluff. Also, in this stretch of the river from Eudora to Kansas City there are very few terraces.

POPULATION

The Kansas River touches on or passes through 10 counties along its course. Those are Riley, Geary, Pottawatomie, Wabaunsee, Shawnee, Douglas, Jefferson, Leavenworth, Johnson and Wyandotte. These 10 counties had a population of slightly less than one million in the 1990 census. This represents 40% of the state's two and a half million population. Eight of these 10 counties gained population between the 1980 and 1990 census years, and the net gain of these 10 counties equals 97% of the state's net gain in population between those two census years. The

population density of the 10 county area is 182.3 people per square mile. This is 6 times as dense as the state as a whole, which has an average density of 30.3 people per square mile. Although there are roughly one million people in the Kansas River valley now, by the year 2025 it is projected that the population of these 10 counties will be 1.3 million, nearly 50% of the state's population at that time. Such growth demands new infrastructure and new construction, and one resource necessary for new construction is aggregates.

AGGREGATES

I need to define an aggregate. An aggregate is any hard inert material used for mixing with a cementing or bituminous material to form concrete, mortar, asphalt or similar product, or used alone as in railroad ballast, road covering or fill.

Aggregates are not the most exciting material extracted from the earth. When sand was discovered in the Kansas River valley, it is unlikely this discovery was heralded with banner headlines in the local paper. Anything that you buy by the ton and deliver by the truckload is not considered a precious commodity unless it is no longer available. But it is the stuff of which civilization is built. This morning you no doubt left a home containing aggregates, traveled on streets, highways, and sidewalks containing aggregates, and today we are assembled in a building held together by mortar containing aggregates.

Although aggregates are inexpensive and in places an abundant natural resource, they are like most of the earth's resources and are not distributed in the uniform, fair or equitable manner. This inequitable distribution of the earth's resources is the reason there are disputes, lawsuits, wars and geologists. The two

main types of aggregates used in Kansas are sand and gravel and crushed stone. Most of the crushed stone in Kansas is produced from the limestones that crop out from the Flint Hills eastward. In the Kansas River valley there are roughly 75 named limestone units. However, only a few of these meet the rigid specifications of the KDOT and other users of aggregates for purity and physical character for use in concrete construction. A recent article in the Kansas City Star dealt with the problem of crumbling concrete in the Kansas City area and laid the blame on the use of crushed limestone from eastern Kansas. Today, more sand and gravel is being substituted for crushed stone. The average mixture in highway concrete is 65% sand and gravel to 35% crushed limestone. KDOT estimates that a one mile concrete highway, two lanes wide and nine inches thick, uses 3,400 tons of sand and gravel at the cost of \$12,350. In Kansas, the use of sand and gravel breaks down as follows: concrete aggregate - 50%, asphalt aggregate - 21%, fill sand - 14%, road base and covering - 11%, and other uses 4%. This includes treatment of icy roads, sand blasting and fiberglass production. Twenty-five percent of the sand and gravel produced in the Kansas River corridor is used by the Kansas Department of Transportation.

PRIMARY SOURCES OF SAND AND GRAVEL

The primary sources of sand and gravel in Kansas, and here I will refer to the state geologic map, are the Kansas River, and also the lower tributaries of the Kansas River such as the Republican, Big Blue and Smoky Hill, the Arkansas River, which is extensively mined in the Wichita area and other places, and the Missouri River, which has a drawback in that much of its sand contains lignite, a form of brown coal

that causes dark spots in the concrete which can lead to cavities and make it susceptible to attack by the elements. The Neosho River is mined for cherty gravels that are found along its course.

Another source of sand and gravel is in western Kansas where Ogallala and younger deposits of sand and gravel are mined in dry pits generally located above the water table. The ultimate source of sand and gravel comes from two sources: the glacial drift, left behind by the glaciers in northeast Kansas, which was carried into the state from Canada and the north-central parts of the United States; the other source of sand and gravel in Kansas are the sand and gravel deposits of the high plains that were washed into Kansas from the west and the Rocky Mountains. Rivers that do not drain these two areas, the glaciated area, and the Ogallala type deposits of western Kansas, generally do not have economic deposits of sand and gravel in their river beds.

DREDGING

The Kansas River is a major source of sand and gravel in northeastern Kansas. Sand and gravel is produced by two dredging processes: river dredges and flood plain or pit dredges. I refer you to Figure 1.1, one of the colored maps of the Kansas River valley that we have given you. This map shows the river corridor, permits for dredging, exclusion zones to river dredging, river miles and some other pertinent information.

River dredges operate directly in the river. They mine the bed material of the river which is generally sand and small gravel. This material contains very little mud or clay, therefore there is very little waste. Nearly all the material taken from

the river can be used as a commercial product. This results in some of the best quality, least expensive sand in the United States. U.S. prices for sand at the plant range from \$3.00 to \$15.00 a ton. In Kansas City, sand at the plant cost on average \$3.60 per ton. In 1996, 2.4 million tons of sand and gravel were produced from the Kansas River. This represents 75% of the sand and gravel produced in the 10 county area along the Kansas River. Producers pay a \$.15 per ton royalty on sand taken from the Kansas River and in 1996 this resulted in \$360,000 paid in to the Kansas treasury.

Flood plain dredges or pit dredges operate on the flood plain of the river at some distance from the river and mine the alluvial fill of the river valley. Here I refer to the other colored map, Figure 2.1, which shows industrial mineral operations and cross section locations along the Kansas River corridor. On this map, river dredges are shown by the orange circles, and pit dredge locations are shown by the circles with the orange x's in them. In addition, limestone quarry sites for crushed limestone and building limestone are shown by blue circles and squares respectively. Also, shown on Figure 2.1 are red lines that cross the Kansas River. These are lines along which cross sections have been constructed in previous KGS reports. Three of these cross sections, A, B and C are shown in Figures 2.2, 2.3, and 2.4 on one of your other handouts. On these cross sections, the vertical scale has been expanded in relation to the horizontal scale to make the cross sections a little bit more readable. These cross sections show the typical sequence of materials encountered when one mines into the river flood plain. The uppermost part of the flood plain and much of the terrace deposits are composed of soil and also over-

bank deposits. These are generally fine materials such as clays and silts that were deposited at times of flood at some distance from the river channel itself. The soil and these fine materials represent overburden that must be removed and used as fill or possibly as topsoil. There is limited market for this material. The next material often encountered is fine sand. Much of that is also unusable, however, a small amount can be used and sold as masonry sand. The deeper layers on down to bedrock often contain large amounts of sand and gravel and this is the desired material. However, within this sand and gravel sequence there may be lenses of clay or silt material that again have very little market value. In general, the overburden must be removed down to the water table in order to float the dredge that will then dig up the sand and gravel.

It is worth noting in each of these three cross sections that the deepest point in the bedrock channel carved by the Kansas River, and the modern day location of the Kansas River are at a different location. The thickest sequence of alluvium shown on these cross sections is roughly 90 feet or so shown on the Topeka cross section, along the north side of the Kansas River valley.

PIT DREDGING VS. RIVER DREDGING

Some comparisons of pit dredges and river dredges. First of all, permits. Pit dredges are permitted by the State Conservation Commission with approval from the appropriate county commission. River dredges are permitted by the United States Army Corps of Engineers with approval of plans by the Division of Water Resources of the Kansas Department of Agriculture. At the time of this report, there were seven pit dredges operating in the Kansas River corridor and nine river

dredges. All the river dredges operated from just west of Topeka down stream to the river's mouth. A pit dredge requires much more land. At minimum it is estimated that 100 acres are required for a successful pit dredge operation, and this land is often expensive bottom land. A river dredge requires only about 10 acres of land necessary for the screening and storage of material, and this is generally located along the river bank. A pit dredge operation generally requires drilling or some sort of exploration program to ensure that adequate supplies of sand and gravel are available for mining. This generally is not necessary for the river dredge. With a pit dredge, overburden must be removed at some cost and the pit must be excavated down to the water table, which may be at some depth below the surface. On a river dredge, there is no overburden and no unnecessary excavation is needed. Unused material produced by pit dredging incurs some cost to be disposed of or removed. With a river dredge, there is very little in the way of unusable material. Pit dredges also require reclamation. With river dredges there is no reclamation. In addition, when a pit dredge is shut down, they leave a large hole in the flood plain in which the water table is exposed, creating a potential avenue of pollution and also a potential loss of water resources through evaporation. In general, in the lower Kansas River area, sand produced by pit dredging is 50% more expensive than sand produced by river dredges.

Bleckinger, in a 1997 master's project in Civil Engineering at the University of Kansas, did an analysis of sand mining alternatives along the Kansas River. He evaluated most of the water well logs located at the Kansas Geological Survey for wells drilled in the Kansas River valley. For these he determined overburden ratios

which is the ratio of overburden in volume to ton of underlying sand and gravel, and he did this for each mile square section for which information existed. After analyzing various factors affecting the cost, he was left with 74 potentially profitable pit dredging sites in the Kansas River valley. Most of these are in the upper part of the Kansas River valley from Shawnee County westward. Forty-nine occur in Shawnee, Pottawatomie, and Wabaunsee counties where the flood plain is quite wide. Only nine potentially profitable pit dredging sites were found east of Douglas County.

CONCLUSIONS ON DREDGING

Conclusions regarding dredging in the Kansas River are as follows: in general, the Kansas City to Lawrence stretch of the river favors river dredging. In this area the flood plain is much narrower and the land available for pit dredging is tightly restricted by commercial development, railroad yards, highways, pipelines and expensive farmland. In addition, the overburden, that unusable material lying above the commercially valuable sand and gravel, is much thicker in this portion of the river valley.

The Lawrence to Topeka stretch of the river is slightly more conducive to pit dredging. Here the flood plain is a little bit wider, however, the overburden is still thick, and the depth to the water table is also a problem. In addition, much of the land in this area is farmed and more expensive and difficult to obtain. The Topeka to Junction City stretch of the river appears to be the most likely area for successful pit dredging. Here the flood plain is quite wide making more land available that is less expensive. Commercial and industrial usage of the flood plain is less than in

areas down river. In addition, the overburden is thinner and the water table is much closer to the surface. At the present time, all dredges operating above Topeka in the Kansas River valley, are pit dredges.

ALTERNATIVE SOURCES OF SAND AND GRAVEL

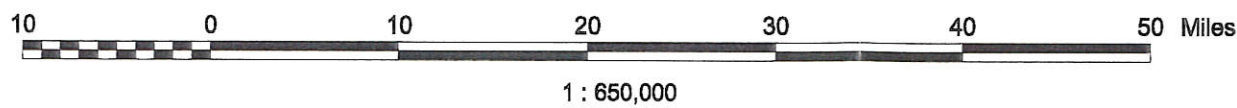
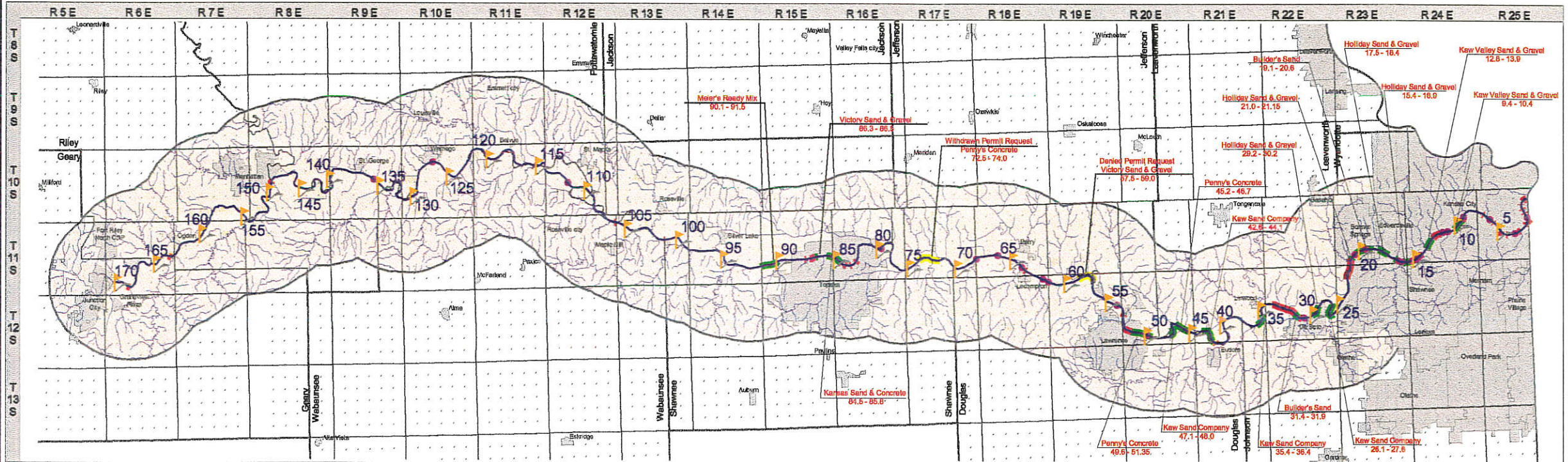
For this discussion I refer you to Figure 2.8, the two maps of eastern Kansas with the arcs drawn in various locations. A major expense in the use of sand and gravel is its transportation costs. Ten cent per ton-mile is an average cost for transporting sand and gravel. However, this may range from \$.08 to \$.25 per ton-mile. Most producers do not haul sand and gravel farther than 50 miles. They find these long runs are less profitable than shorter hauling distances. This effectively rules out the Arkansas River as a source for sand and gravel in the Kansas River area except in unusual circumstances. In 1993, such unusual circumstances occurred when flooding along the Kansas River caused the dredges to shut down. At this time, some sand and gravel was shipped into the Kansas River area from the Arkansas River, and this sand and gravel was selling for \$15.00 a ton. This compares to \$3.60 a ton average for Kansas River sand at plants in the Kansas City area. If river dredging were removed from the Kansas River, the few pit dredges on the narrow flood plain of the lower Kansas River valley would be inadequate to meet the demand in that rapidly growing area, and pit dredges in the upper Kansas River valley would be too far away and transportation costs would be very high. As a result, more Missouri sand would have to be used. And even after attempts are made to remove the troublesome lignite, it is still not suitable for some construction jobs. If no sand were taken at all from the Kansas River, only the lower parts of its

tributaries and the Missouri River would be sources in northeastern Kansas. The lower map of Figure 2.8, shows that Topeka would lie outside 50 mile arcs drawn around these sources and as a result transportation costs in this area would be very large.

Continued growth in the 10 county area along the Kansas River will guarantee a strong demand for aggregate. Between 1980 and 1996, there was a 20% increase in population in these 10 counties. This compares to a 9% increase for this state as a whole during this same period. It is important that adequate reserves of aggregates are available to meet this increasing demand.

Kansas Geological Survey Kansas River Study

Kansas River Corridor - River Permits and Exclusion Zones to River Dredging - October, 1997

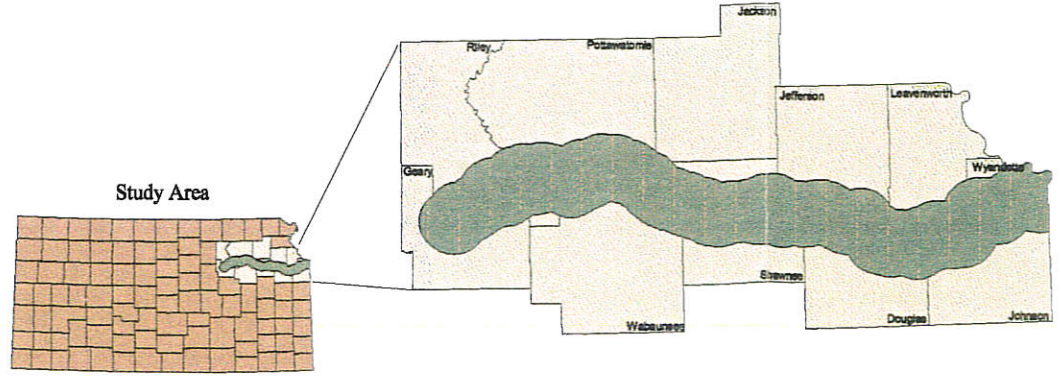


Primary Features:

- Streams and Rivers
- No Dredging Zone
- Sand Permit
- Withdrawn/Denied Permit Applications
- Pipeline Crossing
- River Mile Marker

Base Map Features:

- County Boundaries
- City boundaries
- Township boundaries
- Section corner points



Citation Information:

Base map information (County boundaries, City Boundaries, Township boundaries, Section Corner Points, and Hydrography) were obtained from the State of Kansas Data Access and Support Center (DASC) at the Kansas Geological Survey (KGS)

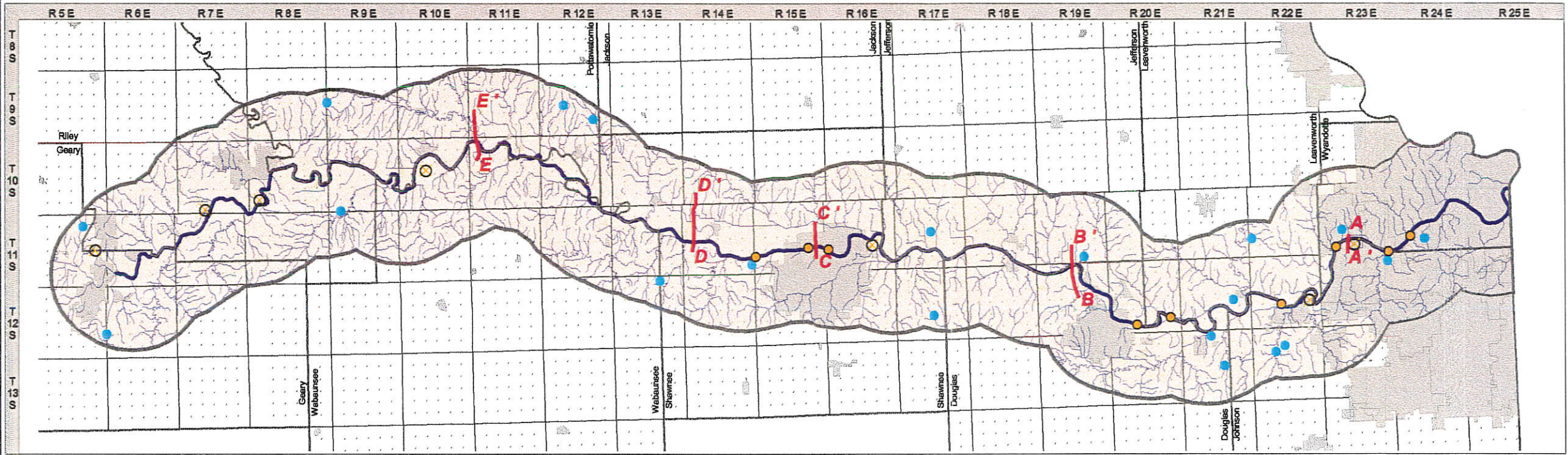
Permits, Restricted Areas, and River Mile Markers were extracted from other cartographic sources and digitized for use on the Kansas River Study.

Projection Information:

Lambert Conformal Conic (Clarke 1866)	
Central Meridian	-98 15 00
Reference Latitude	36 00 00
Standard Parallel 1	33 00 00
Standard Parallel 2	45 00 00

Kansas Geological Survey Kansas River Study

Industrial Mineral Operations and Cross Section Locations along the Kansas River Corridor



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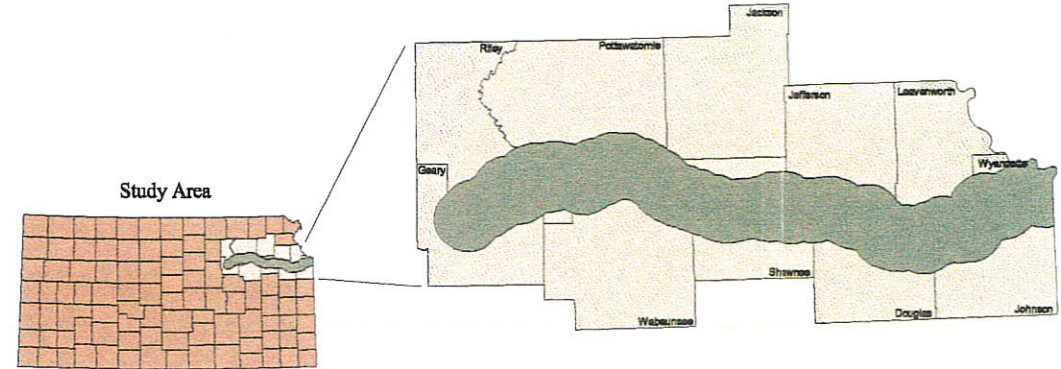


Primary Features:

- Streams and Rivers
- Cross-Section Locations (A - A')
- River Dredge Locations
- Pit Dredge Locations
- Crushed Limestone
- Building Limestone

Base Map Features:

- County Boundaries
- City boundaries
- Township boundaries
- Section corner points



Citation Information:

Base map information (County boundaries, City Boundaries, Township boundaries, Section Corner Points, and Hydrography) were obtained from the State of Kansas Data Access and Support Center (DASC) at the Kansas Geological Survey (KGS)

Pit dredge locations were obtained by converting legal descriptions to geographic coordinates. River dredge locations were plotted using river mile markers as a reference

Projection Information:

Lambert Conformal Conic (Clarke 1866)	
Central Meridian	-98 15 00
Reference Latitude	36 00 00
Standard Parallel 1	33 00 00
Standard Parallel 2	45 00 00

1-16

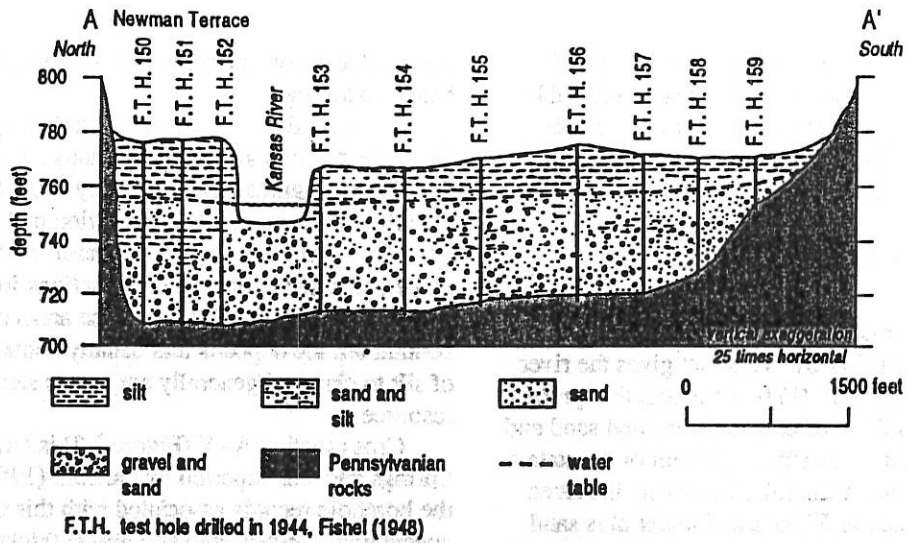


FIGURE 2.2—CROSS SECTION A-A' OF THE KANSAS RIVER, EAST OF BONNER SPRINGS, KANSAS. Modified from Dufford (1958, p. 10).

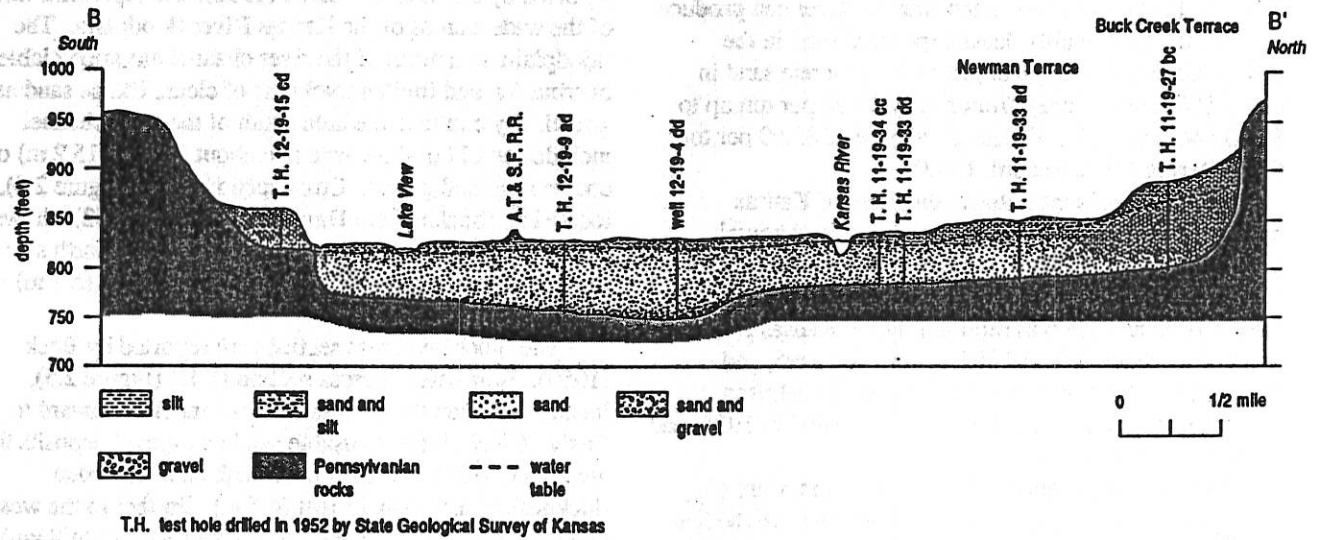


FIGURE 2.3—CROSS SECTION B-B' OF THE KANSAS RIVER, NORTHWEST OF LAWRENCE, KANSAS. Modified from Davis and Carlson (1952, pl. 3).

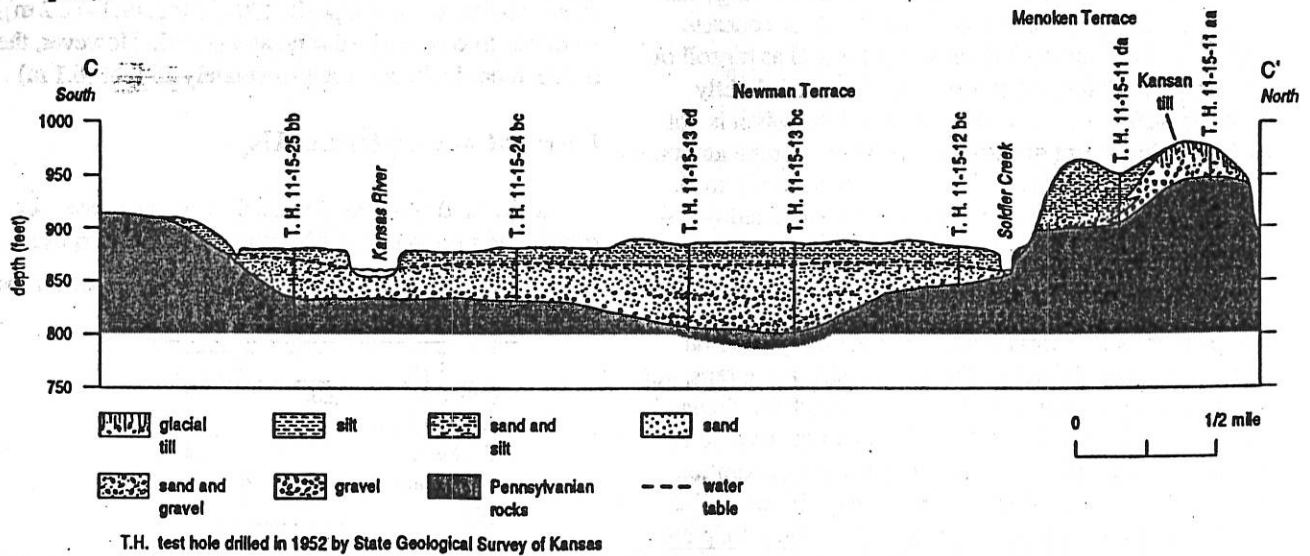


FIGURE 2.4—CROSS SECTION C-C' OF THE KANSAS RIVER AT TOPEKA, KANSAS. Modified from Davis and Carlson (1952, pl. 3).

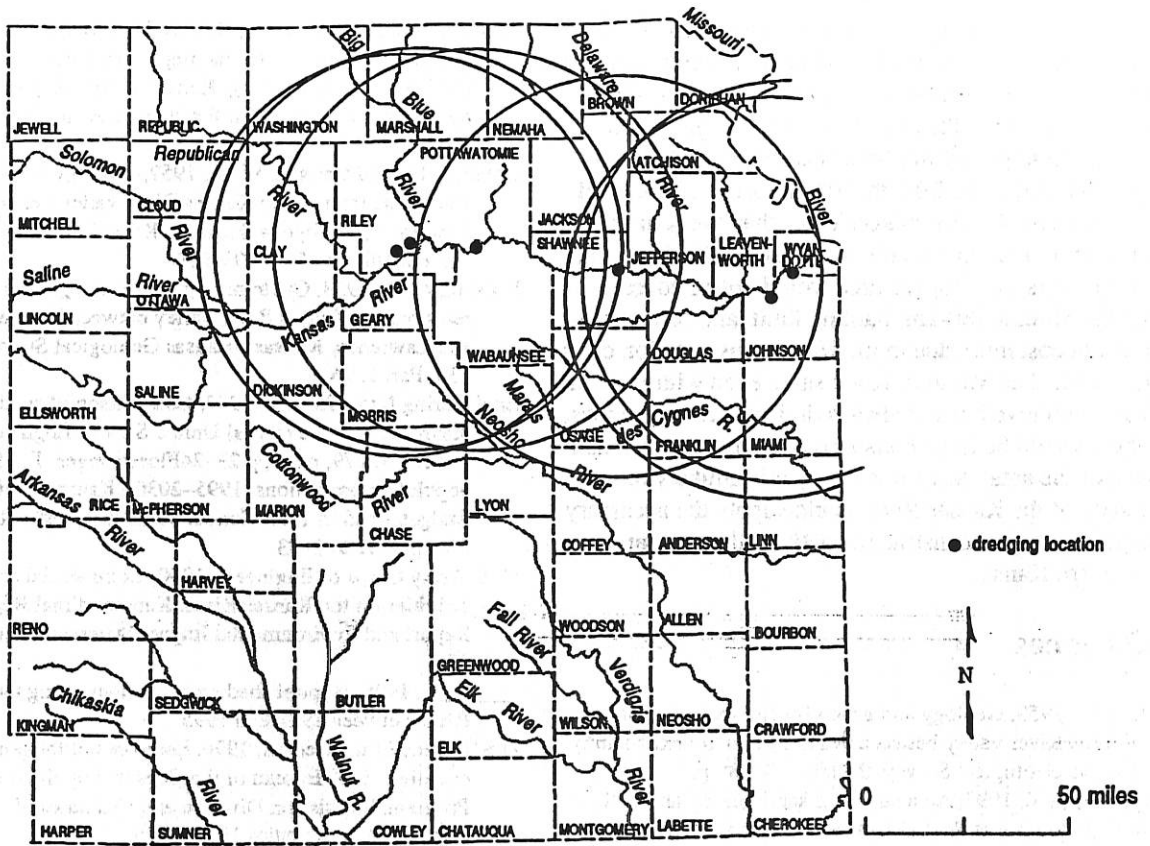


FIGURE 2.7—MAP OF EASTERN KANSAS WITH ARCS OF 50-MILE (80-KM) RADIUS FROM EXISTING PIT-DREDGING OPERATIONS.

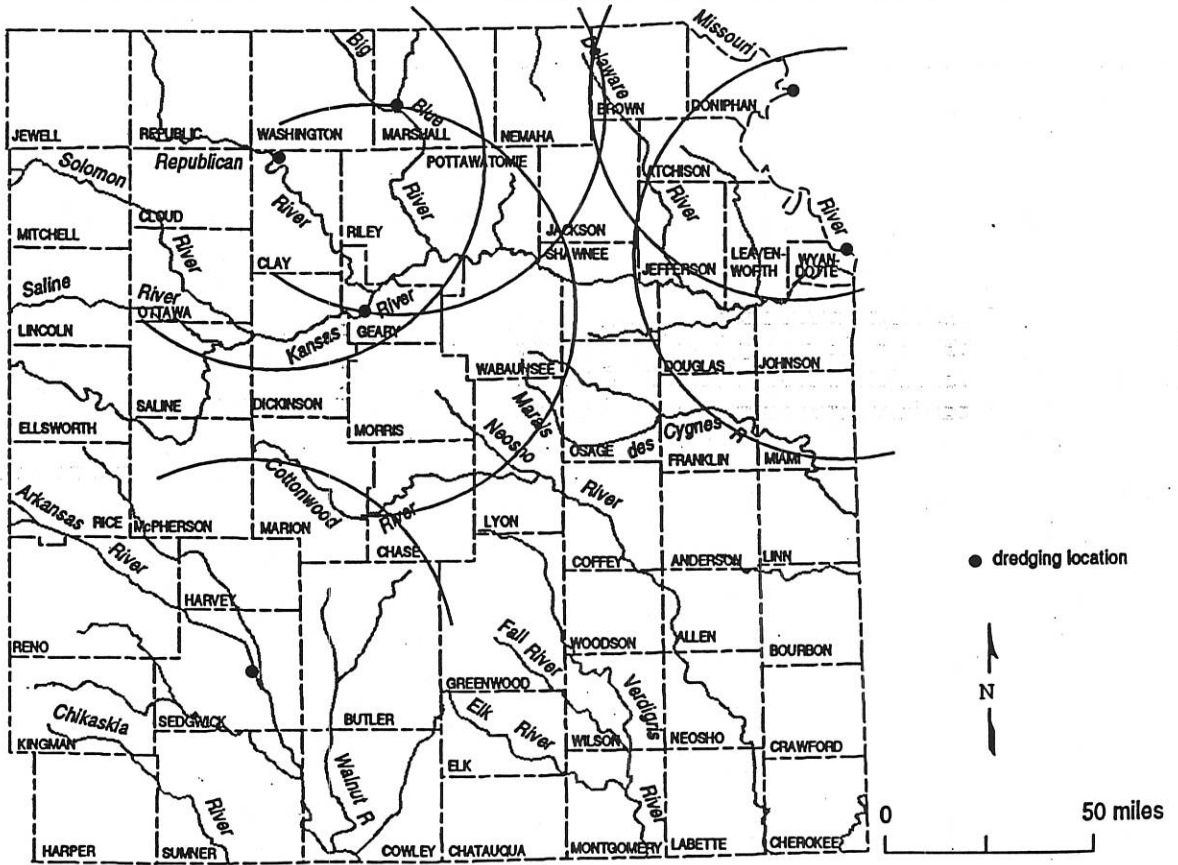


FIGURE 2.8—MAP OF EASTERN KANSAS WITH ARCS OF 50-MILE (80-KM) RADIUS FROM EXISTING OPERATIONS OTHER THAN THE KANSAS RIVER.

Kansas River Recreation Study

**Testimony presented to
the
Kansas House of Representatives
Environment Committee**

**By
James T. Janousek,
Manager of Research and Analysis
Kansas Department of Commerce & Housing
February 5, 1998**

*HOUSE ENVIRONMENT
2-5-98
ATTACHMENT 2*

Chairperson Freeborn, members of the House Environment Committee, thank you for the opportunity to report on the findings and recommendations of the Kansas River Recreation Study.

My name is Jim Janousek. I am the Manager of Research and Analysis for the Kansas Department of Commerce & Housing. Accompanying me today are representatives of the five-agency study group that was tasked with performing the Kansas River Recreation Study. The members of the study group were:

1. Cathy Tucker-Vogel, Kansas Water Office
2. Roger Wolfe, Kansas Department Of Wildlife & Parks
3. Lawrence Brady, Kansas Geological Survey
4. Dave Grisafe, Kansas Geological Survey
5. Paul M. Liechti, Kansas Biological Survey

I will be providing a brief summary of the study findings and recommendations. You should have before you a copy of my statement and a complete copy of the study for your reference. The participating agencies have also prepared statements which they will provide following my presentation.

The Kansas River Recreation Study has been performed in compliance with legislation passed by the 1996 Kansas Legislature in Section 78 of Senate Bill 757. The legislature directed that the Kansas Department of Commerce & Housing in conjunction with the Kansas Water Office, Kansas Geological Survey, Kansas Biological Survey and the Kansas Department of Wildlife and Parks; conduct a study of the development of recreational opportunities within the Kansas River.

Issues identified in the study were related to the development of recreational activities on the river. The assessment of economic potential for river recreation and the degree of compatibility of recreational and commercial use of the river were also concerns of the study group.

Summary Of Data

Recreational Interest

The survey of recreational interest provided information on the type and relative level of interest in a wide variety of recreational activities. The top three categories of interest identified in the survey were wildlife observation, canoeing and bird watching. Respondents to the survey also identified the segment of the river from Topeka to Lawrence as the highest use portion of the river.

Landowner Survey

A survey of persons owning property adjacent to the Kansas River was also performed during the study. The information provided by landowners was used to assess their attitudes and perceptions related to river recreation.

The major points identified in the survey were:

- Landowners are not predisposed to voluntarily provide access through their property. The survey did identify a number of landowners who would not reject such participation depending upon the circumstances of such agreements.
- Landowners are concerned with potential problems that may occur if recreational use of the river increases. While increased access would result in increased usage, it may also have the effect of reducing problems of trespass and damage of property caused by persons attempting to use the river.

- Landowners also had concerns about related issues: water pollution, impacts of sand dredging on the river and on their property, and stream flow issues were the primary concerns expressed.

Economic Impact

The analysis of the economic potential of recreation on the Kansas River was focused on water related river recreation. Specifically the potential economic benefits of canoeing, and other non-powered boating activities were considered.

The impact of outdoor recreation in the state of Kansas is significant. As identified in the 1996 USFWS Study, 793,000 residents expended \$275,793,000 in 1996 on recreation. Kansas residents in the twenty-four counties participate in a wide variety of outdoor recreation in the state and in surrounding states.

In 1996 it is estimated that 56,877 residents participated in canoeing, floating or rafting an average of 2 days. The resulting 113,754 Unit Days of participation result in \$2.8 million in direct expenditures. This \$2.8 million represents the market potential for river recreation in the region.

This figure does not include multiplier effects on employment and income that are generated by the direct expenditures and reflects only the current participation rates in the region. Increases in participation, due to better access to the river, would cause a proportional increase in direct and indirect spending and economic impacts. If improved access raised local participation rates to the national average of 7%, the total direct impacts would be approximately \$3.4 million.

Study Conclusions

The information reviewed by the committee in the process of the study has led to the following conclusions.

- The Kansas River is an underdeveloped and underutilized state recreational resource. As one of three navigable rivers in Kansas, the Kansas River represents a unique recreational resource. The state of Kansas has no other stream recreation resource of this type.
- The majority of recreationists and land owners do not want a highly developed, and costly, infrastructure developed for recreation on the Kansas River.
- The primary need identified by recreationists are access for non-motorized boating activities such as canoeing, kayaking, floating, rafting, etc., and continuous segments of the river that are free of commercial operations that take place in the river.
- Landowner concerns about negative effects of increased recreation on the river are tied to issues related to access. Increased access may cause fewer problems related to trespass, parking, and confrontations with persons using the river.
- Economic benefits that may result from the development of the river as a recreational resource are not insignificant. Several smaller communities, such as St. George and Lecompton, are actively supporting the development of river access in their communities as a tourism development activity.
- Concern about the river itself is a major issue. Landowners have identified water quality, pollution in the river, bank stabilization; dredging impacts and the fluctuation of river levels as related concerns. The U.S. Army Corps of Engineers (USACE) has also instituted a regulatory plan that has placed limits on dredging operations while continuing their study of the effects of dredging on streambed degradation in the lower Kansas River.

Recommendations

The study team, upon review of the information presented in the study and the conclusions that emerged from discussion of this information, have identified several recommendations that are presented to the legislature for action.

- 1. The committee recommends that recreational use of the Kansas River not be limited to specific sections or reaches of the river. The entire Kansas River shall be open for recreational usage.*
- 2. The committee recommends that the Kansas River Access Plan developed by the Kansas Department of Wildlife and Parks be implemented by the state. The access plan, which identifies access points for future development on the Kansas River, is a minimum level for access development. Reassessment of the status of the river and needs related to river access shall be undertaken by KDWP on a regular basis and further development will be evaluated based on the guidelines of the Kansas River Recreation Sub-Section of the Kansas Water Plan, and incorporated into the Kansas River Access Plan as required.*
- 3. The majority of the committee recommends that, as part of application for any future permits for structures in the Kansas River, or for commercial use of state resources associated with the Kansas River, a "Recreation Compatibility Plan" must be submitted to the Chief Engineer, Kansas Division of Water Resources, and approved by KDWP.*
- 4. The committee recommends that the management and development of recreational use of the Kansas River be provided by the Kansas Department of Wildlife and Parks.*
- 5. The committee recommends that KDWP investigate the availability of public and private property owners who would volunteer to participate in a "Fishing Access" program to provide access to the Kansas River.*
- 6. The committee recommends multi-use, including both recreational and commercial usage, of the Kansas River. The committee strongly urges the legislature to set aside a portion, or portions, of the Kansas River for exclusive recreational use. This recommendation would exclude commercial use of the river, specifically in-river sand and gravel dredging operations, in segments established as recreational areas.*

Summary

Adoption of the report and its recommendations would provide an affirmation of the importance of the Kansas River as a recreational resource that should be included in the state's outdoor recreation planning process.

Recommendation two, the implementation of the Kansas River Access Plan, has been proposed by the Kansas Water Authority and funding for the construction of two access points is included in the Governor's FY1999 Budget recommendation. A commitment by the state to approve the funding of these access points would be desirable.

Recommendation three would require legislation directing that a recreation compatibility plan be required as part of the permit application and review process. The legislation would establish the requirement and direct the Kansas Department of Wildlife and Parks to develop plan criteria.

The sixth and final recommendation that the legislature identify a specific segment, or segments, of the Kansas River that would be set aside as recreational and conservation areas is crucial to the development of the Kansas River as a recreational resource. This recommendation provides for the optimum conditions to develop contiguous recreational opportunity on segments of the river not currently impacted by commercial activities.

This completes my portion of the presentation, at this time I would yield to Cathy Tucker-Vogel from the Kansas Water Office.

STATE OF KANSAS



Bill Graves, Governor

KANSAS WATER OFFICE
Al LeDoux
Director

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KANSAS RIVER RECREATION STUDY
Kansas Water Office Comments

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Presented to
the
House of Representatives Environment Committee
February 5, 1998

Madam Chairperson, members of the committee, my name is Cathy Tucker-Vogel from the Kansas Water Office and I am here today representing the Director, Al LeDoux.

The Kansas Water Office fully endorses the six recommendations put forth in the Kansas River Recreation Study Report dated January 12, 1998. The Water Office would like to provide additional comments related to recommendations 2, 3 and 6.

Recommendation 2 (Implementation of Kansas River Access Plan)

The Kansas River Access Plan (Attachment 5 in report) developed by the Kansas Department of Wildlife and Parks (KDWP) in 1996 implements the *Kansas Water Plan* Sub-Section: Fish, Wildlife and Recreation (Attachment 9 in report) approved by the Kansas Water Authority in FY 1992. The Kansas Water Authority and Governor Graves has recommended \$132,000.00 from the FY 1999 Water Plan Fund for construction of two priority access sites. These sites are located at St. George and Perry/Lecompton. We would urge the Legislature to approve the funding for these two sites so that construction could begin in the summer of 1998. In addition, funding sources for the remaining sites in the Access Plan need to be identified. Without increased access to the Kansas River the economic potential from recreational development cannot be fully realized.

Recommendation 3 (Recreation Compatibility Plans for permitted activities)

The Water Office strongly supports the recommendation that permits for structures in the Kansas River have a Recreation Compatibility Plan. This plan should be approved by the Kansas Department of Wildlife and Parks prior to the issuance of the permit by the Division of Water Resources. Our Office suggests that a set of guidelines be developed that identify the components that should be included in the Recreation Compatibility Plans. Having a set of guidelines should help prevent unnecessary delays in the permitting process. The Water

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Attachment 3

Office also suggests that the KDWP seek input from municipalities, aggregate producers, public utilities, recreational interests and the Division of Water Resources in developing these guidelines.

Recommendation 6 (Designation of river segments)

The Kansas Water Office recognizes the many and often conflicting interests associated with the Kansas River. As a result, the Office supports a multi-use concept of the River. This concept would allow for segments of the Kansas River to be designated for exclusive recreation and conservation use, while in-river commercial and industrial use as well as recreation would be allowed in other segments. This provides protection for areas that have not been impacted by commercial operations in the river, while at the same time leaving existing operations intact and allowing for new operations in other segments. This preserves the recreational economic growth potential without undue adverse impacts to commercial interests. This also preserves existing sand and gravel deposits in the river for use in the distant future if the need should arise. This multi-use approach provides for maximum utilization of the Kansas River for the benefit of all Kansans. Our office has provided information to Representative McClure on river segment designation and would be happy to provide additional testimony on legislation related to this issue at the appropriate time.

In closing, we would like to urge this committee and 1998 Legislature to take action on all six of the recommendations outlined today. Establishing a clear policy on how the Kansas River will be used in the future will help to avoid previously experienced delays in the permitting process. I appreciate the opportunity to present this information to you and would be glad to answer any questions you might have.



STATE OF KANSAS
DEPARTMENT OF WILDLIFE & PARKS

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KANSAS RIVER RECREATION STUDY
1996 SENATE BILL 757 SECTION 78

Testimony provided to the House Committee on Environment.
February 5, 1998
Provided by: Kansas Dept. of Wildlife and Parks

KDWP's historic role in Kansas River recreation:

- 1985 State Comprehensive Outdoor Recreation Plan (SCORP) by Park & Resource Authority recommended policy to designate specific recreation streams and provide for limited in-stream public use for canoeing and other float-type watercraft.
- 1990 The 1992 Fiscal Year Kansas Water Plan contained in the Kansas Lower Republican Basin sub-section requesting KDWP to develop a stream access development program for the Kansas River. The program was to provide for the evaluation of relative priorities of the stream reaches which currently had public access and to develop a five-year plan (updated annually) to improve facilities in the priority reaches.
- 1995 Kansas-Lower Republican Basin Advisory Committee (KLR-BAC) directed KDWP to develop a plan on Kansas River Recreation Access.
- 1996 KDWP submitted a plan for Kansas River Recreation Access for the (KLR-BAC). This plan outlined current Kansas River access points and recommended future needs for access on the Kansas River.
- 1997 KDWP served on the multi-agency committee to look at the economics of recreation on the Kansas River.

Overview of KDWP's position on the development of additional recreational opportunities on the Kansas River:

- KDWP supports providing additional recreational opportunities to the Kaw since it is a public river.
- KDWP supports the concept of requiring a "Recreational Compatibility Plan" for future permit requests. This would help to ensure compatibility of commercial and recreational uses.
- KDWP is in support of setting aside certain sections of the river for recreational use that will not be impacted by dredging activities in the future while allowing dredging operations to continue and expand in other sections of the river.
- KDWP is in support of enhancing the facilities needed for access to the Kansas River within funding limits.
- KDWP supports the use of State Water Plan funds to develop facilities for recreational access to the river.

*House Environment
2-5-98
Attachment 4*

Comments To:
House Environment Committee

Regarding the Kansas River Recreation Study

Submitted by:
Kansas Biological Survey
February 5, 1998

Representative Freeborn, members of the Committee, my name is Paul Liechti. I am the Assistant Director of the Kansas Biological Survey and served as the Survey's representative on Kansas River Recreation Study. I would like to thank you for the opportunity to speak before the committee regarding the recreation study and to convey to you the Survey's thoughts on a couple of aspects of the study contained in the report to the Legislature.

As background, the Kansas Biological Survey (KBS) is a research and service unit of the University of Kansas and a non-regulatory agency of the State. As such, KBS provides current, accurate, and objective information to decision-makers based on scientific research, which is perhaps a reason the Survey was asked to serve on the recreation study team. Over the last 100-plus years of cataloging and studying the plants, animals and natural communities of Kansas, we have learned much about the State's biological resources; not only where things are found but also how the flora, fauna, and ecology of the State has changed over time. There is little doubt that, except for infrequent natural catastrophes, that the most dramatic changes that have occurred in the biological resources of Kansas have been the result of our own actions; making the responsibility of managing our natural resources increasingly complex.

Although not a prominent topic during discussions among study team members, the premise that guided the Survey's thoughts as we evaluated information gathered during the study was that the biological diversity of the Kansas River is directly related to the physical diversity and quality of habitats available and that the recreational enjoyment of the river is strongly linked to both the physical character and biological health of the river system. After considering the physical and biological characteristics of the river and the changes that have occurred over time,

it became evident that some segments of the river still retain good physical and biological features and, consequently, possess the aesthetics and other natural qualities valued by recreationists. At the same time we learned that the river has and does serve as an important resource for more than just recreation. Therefore, the task put before us, and the other agencies represented on the recreation study team, was to evaluate the river as a recreational resource in the context of the array of the other benefits the river provides. Then, based on our findings, offer recommendations to the Legislature, which Jim Janousek just summarized for you.

The Biological Survey believes that the recommendations developed by the study team are reasonable and, if thoughtfully acted upon, would be a positive step toward development of the Kansas River as a viable recreational resource. However, I would like to make a few brief comments about Recommendations three and six.

Recommendation three pertains to submission of a Recreation Compatibility Plan to the Chief Engineer for future permits for structures in the Kansas River. These plans would also need approval by the Department of Wildlife and Parks. Since the Biological Survey is a review agency for applications submitted to the Chief Engineer for water development projects, any Recreation Compatibility Plan submitted by an applicant would likely be included with the materials sent to us for review by the Division of Water Resources. In the interest of keeping the environmental review process unencumbered, we feel that guidelines for the development of a Recreation Compatibility Plan should be formulated in advance and that those interests most likely required to submit a plan be involved in the development of the guidelines. A set of well-defined guidelines would help avoid misunderstandings by the applicants and the review agencies that might otherwise lead to unnecessary delays in the permit review process.

Recommendation six urges the legislature to act to set aside a portion or portions of the river exclusively for recreational use. However, minimal guidance is provided as to which portion or portions of the river might be appropriate to set aside. To at least provide a starting point for discussion, the Biological Survey believes more specific guidance concerning possible

exclusive recreational segments should be offered to the Committee. Therefore, the following is suggested by the Survey as possible segments of the river to be set aside exclusively for recreational and conservation use. Identification of recreational river segments was discussed in some detail by the study team and the segments identified below are generally based upon those discussions and information obtained during the study.

Two exclusive recreational and conservation areas are recommended. One segment would be from Lawrence upstream to just east of Topeka. The other segment would be from just west of Topeka upstream to the headwaters of the river. Both segments currently have no in-channel commercial activities.

As I mentioned earlier, the biological diversity of the Kansas River is directly related to the physical diversity and quality of habitats available. These two segments still possess a great diversity of habitats that are represented by a mosaic of mud flats, sand bars, point bars, gravel bars, riffles, and shallow water areas associated with these physical features. Biological production is proportionally highest in these areas in that they provide habitats for at least 100 or more species of aquatic and semi-aquatic invertebrates, and feeding, nesting and resting sites for a variety of birds, mammals, reptiles and amphibians that can number in the dozens of species, depending on the season. The fish community uses shallow water habitats as spawning areas, nesting grounds, and refuge. Approximately 75% of the biological diversity of the river is supported by this mosaic of habitats with the other 25% of the species living in deep water or open-channel habitats.

Unfortunately, the long-term effect of mining sand and gravel from the lower reaches of the Kansas River has been the creation of a greater expanse of deep water habitat and less, species rich, shallow water habitats. The Corps of Engineers has implemented revised dredging regulations to minimize potential negative impacts on the river channel, but the regulations still allow for a 2-foot lowering in stream bed elevation through a five mile stretch of the river. The effects of the new regulations will not be known for a decade or more; nevertheless, artificially

lowering the stream bed by 2 feet over a five mile stretch of the river could affect the mosaic of sand bars and shallow water habitats in the vicinity of dredging operations in segments of the river that are currently in equilibrium or only slightly and slowly degrading. Therefore, in the interest of conserving the State's existing natural biological resources where they still exist, the Survey considered this to be a primary factor when selecting these two river segments for recommendation as recreational and conservation areas.

Other factors considered in refining the location and length of the segments recommended were generally the same as the considerations discussed by others on the study team. These included: current commercial and recreational use of the river; anticipated future commercial and recreational use of the river; the economic implications of altering use; location of accessible out-of-channel sand deposits; results of the interest and landowner surveys; location of current and potentially new river access points; information obtained at public meetings; and information and comments from interested parties attending meetings of the study team.

I would like to thank the committee for the opportunity to provide these comments, and I will try to answer any questions members of the Committee may have.