US Army Corps of Engineers
Kansas City District

Final Regulatory Report and Environmental Impact Statement

COMMERCIAL DREDGING ACTIVITIES ON THE KANSAS RIVER, KANSAS

January 1990

REGULATORY REPORT
AND
ENVIRONMENTAL IMPACT STATEMENT
FOR
COMMERCIAL DREDGING ACTIVITIES
ON
THE KANSAS RIVER

CONTENTS

	Page
CHANGES INCORPORATED INTO THE FINAL REGULATORY PLAN	ii
REGULATORY REPORT	1
ENVIRONMENTAL IMPACT STATEMENT	EIS-1

LIST OF APPENDIXES

APPENDIX A - REGULATORY PLAN FOR COMMERCIAL DREDGING ACTIVITIES ON THE KANSAS RIVER	A-1
A. DREDGING RESTRICTIONS	A-1
B. MONITORING PROGRAM	A-25
APPENDIX B - PUBLIC INVOLVEMENT AND PUBLIC VIEWS AND COMMENTS	B-1
APPENDIX C - LETTERS OF COORDINATION	C-1
APPENDIX D - BIOLOGICAL ASSESSMENT	D-1

CHANGES INCORPORATED INTO THE FINAL REGULATORY PLAN

Several commentors recommended changes to the Regulatory Plan during the public review period for the draft Regulatory Report and Environmental Impact Statement. The recommended changes have been considered and it has been determined that the following changes merit inclusion in the final Regulatory Plan (APPENDIX A):

1. Section II., parts B. and D. of the Dredging Restrictions. The 500,000 ton annual extraction limit per 10-mile-long reach of river, presented in the draft Regulatory Plan, has been changed to a 750,000 ton annual extraction limit per 15-mile-long reach of river in the final Plan.

2. Section VII., part A. of the Dredging Restrictions. The 3,000-foot-long undredged zone downstream of Bowersock Dam, presented in the draft Regulatory Plan, has been changed to a 2,250-foot-long undredged zone in the final Plan.

3. Section III., part A. of the monitoring Plan. The routine collection of channel cross-section surveys and water surface profiles downstream of Turner Bridge (near river mile 9.3), presented in the draft Regulatory Plan, has been eliminated in the final Plan.

4. Section IV., parts A. and B. of the Monitoring Plan. The frequency of channel cross-section survey and water surface profile data collections, presented in the draft Regulatory Plan, has been reduced in the final Plan. The interval between the first and second data collections has been increased from 2 years to 4 years. No other changes have been made to the frequency of these data collections.

REGULATORY REPORT
FOR
COMMERCIAL DREDGING ACTIVITIES
ON
THE KANSAS RIVER

TABLE OF CONTENTS

		Page
I.	INTRODUCTION	1
II.	PURPOSE	1
III.	AUTHORITY	1
IV.	STUDIES AND REPORTS	2
V.	HISTORY AND THE ISSUES	3
VI.	PROBLEM IDENTIFICATION	19
VII.	ALTERNATIVES	26
VIII.	REGULATORY PLAN	33

LIST OF FIGURES

FIGURE 1	COMMERCIAL DREDGING KANSAS RIVER	36
FIGURE 2	COMMERCIAL DREDGING KANSAS RIVER	37
FIGURE 3	COMMERCIAL DREDGING KANSAS RIVER	38

I. INTRODUCTION

Commercial sand and gravel producers operating on the Kansas River are required to secure a Department of the Army permit from the Kansas City District (KCD), Corps of Engineers to authorize their work. In response to various questions and concerns raised in recent years regarding potential adverse impacts which may be occurring as a result of commercial dredging activities on the Kansas River, KCD conducted a series of studies to examine dredging-related impacts. It has been concluded from the studies and other information gathered by KCD that commercial dredging operations have had an adverse impact on the morphology and ecology of the Kansas River and on various nondredging interests 1/ located in and along the river and that continued dredging has a high potential to induce further adverse impacts. As a result of those findings, KCD proposes to implement a comprehensive "Regulatory Plan" which has been developed to aid the District in its administration of permit applications for commercial dredging operations on the river. Implementation of the Regulatory Plan is expected to limit the adverse impacts associated with commercial dredging activities to an acceptable level 2/.

II. PURPOSE

The purpose of this report is to identify the adverse impacts associated with commercial sand and gravel dredging operations on the Kansas River; to cite the studies and other information gathered to address those impacts; to identify alternatives available to eliminate or minimize adverse impacts; and to present the selected alternative and provide a justification for implementation of that alternative.

III. AUTHORITY

The Corps of Engineers authority to regulate commercial dredging operations on the Kansas River is contained in Section

---

1/ The term nondredging interests refers to manmade structures, land and other public or private possessions located in and along the Kansas River.

2/ The term acceptable level of impacts is defined for purposes of this report as a level of impacts that has been determined by KCD to be compatible with the overall public interest involved.

10 of the Rivers and Harbors Act of 1899 (33 USC 403). No regulatory authority is granted under Section 404 of the Clean Water Act since the dredged material is processed entirely on shore.

IV. STUDIES AND REPORTS

The following studies and reports have been prepared to address various issues associated with commercial dredging activities on the Kansas River:

1. "Kansas River, Bonner Springs to Mouth - Degradation of Channel"

Prepared by the U.S. Geological Survey for the Kansas Water Resources Board - completed in 1967.

2. "Impact of Commercial Sand Dredging in the Lower Kansas River" (This is a draft report which was never finalized.)

Prepared by the Kansas City District, Corps of Engineers - completed in 1977.

3. "Review Comments on U.S. Army Corps of Engineers' Report 'Impact of Commercial Sand Dredging in the Lower Kansas River'"

Prepared by Robert L. Smith, P.E., for the Kansas River Committee of the Kansas Aggregate Association - completed in 1978.

4. "The Economic Impact of Proposed Restrictions on Sand and Gravel Production from the Kansas River"

Prepared by Dr. Darwin W. Daicoff for the Kansas River Aggregate Producers Association - completed in 1978.

5. "Fisheries Report for the Kansas River"

Prepared by John R. Kelley, Jr., Ph.D., for the Kansas River Aggregate Producers Association - completed in 1978.

6. "Kansas River Sand and Gravel Study for the Kansas City Construction Committee"

Prepared by Dr. Darwin W. Daicoff for the Kansas City Construction Committee - completed in 1978.

7. "Cumulative Impacts of Commercial Dredging on the Kansas River - A Social Economic and Environmental Assessment"

Prepared by Burns and McDonnell (Engineers-Architects -Consultants) for the Kansas City District - completed in 1982.

8. "Report on the Impacts of Commercial Dredging on the Fishery of the Lower Kansas River"

Prepared by the University of Kansas, Division of Biological Sciences for the Kansas City District - completed in 1982.

9. "Analysis of Channel Degradation and Bank Erosion in the Lower Kansas River"

Prepared by Simons, Li, and Associates for the Kansas City District - completed in 1984.

10. "Recommendations for a Plan to Regulate Commercial Dredging on the Kansas River"

Prepared by Simons, Li, and Associates for the Kansas City District - completed in 1985.

11. "Kansas River Dredging Operations - Baseline Study and Comparison of Alternatives"

Prepared by Booker (Engineers-Architects-Planners) for the Kansas City District - completed in 1986.

12. "Kansas River Water Intake Investigations for the Regulatory Plan - Commercial Sand and Gravel Dredging - Kansas River"

Prepared by Burns and McDonnell (Engineers-Architects -Consultants) for the Kansas City District - completed in 1986.

13. "Kansas River Flood Plain Sand and Gravel Investigations for the Regulatory Plan - Commercial Sand and Gravel Dredging - Kansas River"

Prepared by Burns and McDonnell (Engineers-Architects -Consultants) for the Kansas City District - completed in 1986.

14. "Kansas River Valley Groundwater Impact Investigations for the Regulatory Plan - Commercial Sand and Gravel Dredging - Kansas River"

Prepared by Burns and McDonnell (Engineers-Architects -Consultants) for the Kansas City District - completed in 1986.

V. HISTORY AND THE ISSUES

Background Information

The Kansas River is a major source of sand and gravel for the Kansas City metropolitan area and other communities along the

river. Sand and gravel utilized in the Kansas City area is also obtained from the Missouri River; however, sand from the Missouri River is a less desirable construction material than Kansas River sand due to its finer gradation and the presence of lignite (a mineral interspersed among the sand grains). The primary users of Kansas River sand and gravel are the construction industries, the fiber glass industry and to a lesser extent the general public for noncommercial use.

Sand in the Kansas River valley is generally hydraulically dredged from the river channel, which is unlike many other alluvial river valleys where sand is obtained from pits in the flood plain. The hydraulic extraction of materials from the river produces a relatively low cost product. Hydraulic dredging operations on the Kansas River rely on the dynamics of the river to maintain a constantly renewing source of mineable materials and require only a few acres of land for processing and storage of those materials.

Commercial sand and gravel dredging activities on the Kansas River can be traced as far back as the early 1900s. Currently, 22 individual dredging operations are authorized on the river. However, the actual number of dredges working on the river at any given time varies, with an average near 15. The locations of all currently permitted dredging operations are shown on Figures 1 - 3 on pages 36 - 38 of this report.

The reach of river from the city of Bonner Springs to the confluence of the Kansas and Missouri Rivers (approximately river miles 0 - 22) has historically been the most heavily dredged reach of the Kansas River and contains 10 of the 22 currently permitted operations. Available records indicate that between 75 and 80 percent of the sand and gravel dredged from the river has come from this reach. Sand and gravel extraction during the most recent 4-year period illustrates the trend. The total amount of material extracted from the river for the years 1984 through 1987 was 14,920,968 tons, and of that total, 11,676,948 tons (78 percent) were extracted from the reach of river located downstream of approximately river mile 22.

During the past several decades, various reaches of the Kansas River have experienced severe riverbed degradation 1/, bank erosion and channel widening. The most pronounced adverse effects have occurred in the lower river 2/. Over the years various causes have been attributed to those effects, including

---

1/ The term riverbed degradation refers to lowering of riverbed elevations.

2/ The term lower river refers to the reach of river downstream of Bowersock Dam at Lawrence, Kansas (river miles 0 - 51.8).

commercial sand and gravel dredging, the Federal reservoir system, lowering of the Missouri River's water surface elevations, and other man-induced influences such as Bowersock Dam (a hydroelectric generating facility located near river mile 51.8) and a rock weir constructed by Water District No. 1 of Johnson County near river mile 15 (referred to in this report as the Water District No. 1 weir). The Kansas City District has concluded from its studies and other information gathered by the District during the past 12 years that commercial dredging activities on the Kansas River have been a major factor affecting riverbed degradation, bank erosion, channel widening, natural resource losses, and damages to nondredging interests in and along the lower river. It is apparent that the cumulative effects of dredging in the reach downstream of approximately river mile 22 have had a significant adverse impact on the morphology of the lower 30 miles of the river and on the ecology of the lower 22 miles.

The Period 1967 to 1970

It is unclear at precisely what point in time the commercial extraction of sand and gravel from the Kansas River became an issue. However, as early as the mid-1960s the Kansas Water Resources Board requested the U.S. Geological Survey (USGS) to prepare a report to address the apparent "serious degradation" of the channel downstream of Bonner Springs. The U.S. Geological Survey completed its report entitled, "Kansas River, Bonner Springs to Mouth - Degradation of Channel," in 1967. The report addressed the following issues:

1. Magnitude of changes in the regimen of the Kansas River.

2. Causes for the change in the regimen of the Kansas River, including sand removal, change in sediment load and change in the regimen of the Missouri River.

3. Future changes in the regimen of the Kansas River.

The U.S. Geological Survey report notes that data indicate that the low discharge stage 1/ in an 11-mile-long reach between Bonner Springs and Turner Bridge (bridge located near river mile 9.3) had lowered an average of 2.6 feet for the period 1952 to 1965. A decrease in stage downstream of the bridge (backwater of the Missouri River) was continuous to the mouth of the river, where it measured approximately one-half of a foot. The report states that the observed reduction in stage

---

1/ The term stage refers to the river's water surface level in relation to a specified elevation.

downstream of Bonner Springs could have been caused by such factors as increased reservoir regulation upstream, a change in channel capacity, a change in riverbed slope, a change in sediment load, improved flow characteristics downstream, or the removal of sand. An examination of each of the possible causal factors is addressed in the report, and a negative finding has been presented for each factor, except for the removal of sand. The following statement regarding the future rate of riverbed degradation downstream of Bonner Springs is presented in the report:

> "The rate at which degradation of the channel will continue and its ultimate extent, depend largely on how much sand and gravel are removed in the future and on changes in the frequency and magnitude of floods, bankful flows, and low flows."

The Period 1970 to 1980

The issue of commercial dredging activities downstream of river mile 22 resurfaced again in the early 1970s. At that time, the Atchison, Topeka and Santa Fe Railway Company began expressing its concern regarding degradation of the riverbed in the vicinity of its bridge at Bonner Springs. At the same time, a number of gas pipelines passing through the riverbed downstream of river mile 22 were becoming exposed as a result of riverbed degradation.

Late in 1973 KCD met with several Kansas state agencies and the USGS to consider the possibility of initiating a study of commercial dredging operations between Bonner Springs and Turner Bridge to determine the affect of those operations on riverbed degradation. However, early in 1974, before a decision could be made on such a study, the U.S. Senate Committee on Public Works requested that the Corps of Engineers determine if riverbank stabilization and other channel improvements would be desirable on the Kansas River and its tributaries. Based on the Senate's request, KCD informed interested agencies that a study would be prepared and that it would be expected to provide the information necessary to determine the causes of channel degradation in the Kansas River. The requested Kansas River and tributaries study was initiated in 1977; however, the study did not include a detailed evaluation of commercial dredging impacts, as previously stated, since KCD had determined to address those impacts in a separate engineering report.

Most of the permits authorizing commercial dredging operations on the Kansas River were to expire in the spring of 1977. In response to requests from the Kansas River sand and gravel producers to renew expiring permits, KCD issued a public notice early in 1977, to solicit comments from interested parties.

Comments provided by the U.S. Fish and Wildlife Service (FWS) and the city of Lawrence, Kansas present several important issues.

The U.S. Fish and Wildlife Service responded to the public notice by expressing its concern regarding the "virtually unlimited dredging of sand and gravel in the Kansas River from 1971 to the present" and provided several recommendations to address potential adverse impacts associated with dredging activities on the river. Three of those recommendations are as follows:

1. The annual extraction of sand and gravel from the river should not exceed the annual natural replenishment of those materials by the river system.

2. Commercial dredging and its environmental implications and alternatives should be addressed in an in-depth study.

3. Sand and gravel producers should be encouraged to seek less environmentally sensitive land sites in the Kansas River's flood plain (in lieu of river dredging) for commercial sand and gravel extraction.

The city of Lawrence responded to the public notice by expressing its concern regarding the impacts of dredging operations near Bowersock Dam and an 18-inch-diameter force main sewer buried in the riverbed downstream of the dam. The city requested that KCD examine the potential impacts that may occur to the structures if the proposed permits were issued.

In the fall of 1977 KCD completed a preliminary draft report entitled, "Impact of Commercial Sand Dredging in the Lower Kansas River." Although the report was never finalized, its findings are worth noting. The report states that between 1962 and 1977 sand extraction from the lower river far exceeded the natural replenishment rate of that material, and dredging between 1966 and 1977 left a net deficit in excess of 18 million tons of material. The report notes that the channel downstream of Bonner Springs has widened and deepened since the 1950s. A decline in the water surface during low flows was as much as 8 feet, and channel widening ranged from 50 - 350 feet. The report also states that an analysis of the stability of Bowersock Dam indicates that water surface levels and riverbed elevations downstream of the dam are marginally adequate to prevent sliding failure of the structure. In addition, a sheet pile wall located along the downstream side of the dam appears to be relatively unstable. The removal of additional material immediately downstream of the sheet pile wall could lead to failure of the wall and possibly to failure of the dam. The report notes that if unrestricted dredging continues in the lower river, the slope of the riverbed could be expected to continue to steepen and additional bed degradation would eventually extend upstream to the dam. The report concludes that a preponderance of evidence exists that the unrestricted

removal of sand from the lower river has resulted in severe impacts to the river channel and adjacent land.

Early in 1978 KCD informed all concerned Federal and state agencies that its findings indicate that the unrestricted removal of sand and gravel from the Kansas River has resulted in significant adverse impacts. At that time the producers were operating without Department of the Army authorization. The permits that had expired in the spring of 1977 had not been renewed by KCD due to the objections that had been received by the District and due to the general controversy surrounding the dredging issue. The Kansas City District proposed to interested agencies that all requested permits be issued in order that dredging operations could continue while the issues were being evaluated. Based on the findings of its draft dredging report, KCD recommended to interested agencies that consideration be given to: (a) limiting each producer between De Soto and Bowersock Dam (river miles 31 - 51.8) to a maximum extraction rate of 150,000 tons of sand and gravel per year in order to minimize potential impacts to Bowersock Dam and (b) implementing a 5-year program to gradually limit the volume of material extracted between Turner Bridge and De Soto (river miles 9.3 - 31) to equal the natural replenishment rate of that material by the river system, in order to reduce future degradation in that reach of the river. No restrictions were proposed for the reach of river upstream of Bowersock Dam or downstream of Turner Bridge.

The Environmental Protection Agency (EPA) responded to KCD's proposal to renew expired permits by stating that it does not object to issuance of the requested permits. The Environmental Protection Agency recommended that dredging be prohibited during the April 1 to June 15 fish spawning season and that the proposed 5-year program to reduce extraction volumes be condensed to a 3-year program. The U.S. Fish and Wildlife Service responded to KCD's proposal by stating that it does not object to issuance of the proposed permits provided that KCD implement a fishery study to address the impacts of dredging on the river's fishery, particularly fish spawning. The U.S. Fish and Wildlife Service also stated that it objects to dredging during the April 1 to June 15 fish spawning season.

Early in 1978 (with the consent of other involved agencies), KCD issued the permits requested by the producers, which retroactively authorized dredging activities from April 1, 1977 to April 1, 1979. A need for the fishery study requested by FWS was considered, and it was decided that a decision regarding implementation of such a study would be deferred until a later date. The requested prohibition of dredging activities during the April 1 to June 15 fish spawning season was not implemented since sufficient information was not available to support the need for such a restriction. Due to concerns regarding the stability of Bowersock Dam, the single permit issued for work between De Soto and Bowersock Dam was

conditioned to limit the extraction rate to a maximum of 150,000 tons of material per year. A need to reduce the annual rate of sand and gravel extraction between Turner Bridge and De Soto was considered, and a determination was made that a decision regarding such a reduction would be deferred until a later date.

Shortly after the permits were issued, KCD presided over a joint agency meeting held with the producers. The producers were informed at the meeting that a fishery study and/or environmental impact statement (EIS) may be prepared to address the adverse impacts associated with commercial dredging activities on the river. During the meeting, EPA supported FWS's previous request for a fishery study. Both FWS and EPA stated that their request for such a study was based on information presented in KCD's preliminary draft report, "Impact of Commercial Sand Dredging in the Lower Kansas River."

The joint agency meeting with the producers heightened awareness of the dredging issue among various interested parties. A large number of comments were received by KCD after the meeting in response to various issues raised during the meeting. The largest number of comments were presented by construction concerns objecting to the proposal by FWS and EPA to prohibit dredging during the April 1 to June 15 fish spawning season. Many of the objectors stated that the proposed prohibition would severely disrupt construction activities which would adversely impact local economies. Several comments were received from nonconstruction concerns objecting to the renewal or extension of the recently issued dredging permits after they expire on April 1, 1979, unless potential dredging-related impacts to the river's morphology and ecology are examined in detail by KCD. Water District No. 1 of Johnson County requested that KCD assess the real and/or potential impacts of dredging activities on bed elevations in the Kansas River. They further requested that KCD withhold the future issuance of permits or extensions of permits to authorize dredging operations between Bonner Springs and the confluence of the Kansas and Missouri Rivers until the assessment is made and future impacts are minimized. The U.S. Fish and Wildlife Service and EPA provided comments stating that they would not object to the renewal of dredging permits, after the recently issued permits expire in April of 1979, provided an aquatic/fishery study is initiated to examine dredging-related impacts.

In the fall of 1978 the Kansas Aggregate Producers Association provided KCD with a report entitled, "Review Comments on U.S. Army Corps of Engineers' Report 'Impact of Commercial Dredging in the Lower Kansas River,'" prepared by Professor Robert L. Smith of the University of Kansas. The report challenges KCD's findings concerning the influence of the Federal reservoir system on the stability of the lower Kansas River channel. Mr. Smith states that there is no doubt that the extensive increase

in channel capacity cited for those reaches of the river where active dredging is occurring relates to commercial dredging activities. He states, however, that the extensive increase in channel capacity is a consequence of the development of the Federal reservoir system in the Kansas River basin. Mr. Smith states that the reservoirs have severely curtailed the rate of sand transported by the Kansas River, which has reduced the amount of sand available to replenish the material extracted by commercial dredging operations. Mr. Smith concludes his report with the following statement:

> "To date, the impacts due to dredging are limited to the increased channel capacity which has developed from De Soto to Turner, and this would not have occurred in the absence of reservoir construction."

Two other reports were presented to KCD by the Kansas Aggregate Producers Association in the fall of 1978, and a third report was presented to the District by the Kansas City Construction Committee. These reports tend to support the need for commercial dredging activities and/or minimize potential impacts associated with such activities. The respective titles are as follows:

1. "The Economic Impact of Proposed Restrictions on Sand and Gravel Production from the Kansas River," prepared by Dr. Darwin W. Daicoff of the University of Kansas.

2. "Fisheries Report for the Kansas River," prepared by John R. Kelley, Jr., Ph.D., of the Kansas State University.

3. "Kansas River Sand and Gravel Study," prepared by Dr. Darwin W. Daicoff of the University of Kansas.

In the fall of 1978 KCD informed all interested parties that it would prepare a fishery study and an EIS which would address the impacts associated with commercial dredging activities on the Kansas River. In response to KCD's announcement, FWS and EPA agreed to a proposal to indefinitely extend all dredging permits on the river until completion of the study and EIS. The permits were indefinitely extended early in 1979 and will remain under that extension until completion of the EIS.

In the spring of 1979 KCD awarded a contract to the University of Kansas for a fishery study entitled, "Impacts of Commercial Dredging on the Fishery of the Lower Kansas River." The study was completed in the winter of 1982. The fishery study was an intensive effort to evaluate the impacts of dredging activities on the fishery of the lower Kansas River. The study revealed that moderate rates of sand and gravel extraction from a reach of river could increase fish habitat diversity relative to undredged reaches of the river. Increased habitat diversity results in a greater number of fish species and a larger fish

population. The study further revealed that intensive dredging, such as is found in the 22-mile-long reach of river extending from Bonner Springs to the confluence of the Kansas and Missouri Rivers, ultimately reduces total fish population numbers and species diversity relative to undredged reaches of the river. The heavily dredged lower 22 miles of the river is much deeper and maintains significantly lower flow velocities than undredged upstream areas. This deep slow moving water has resulted in the creation of large silt deposits and lake-like conditions which are undesirable for fish species typically found in undredged areas of the river. The study also determined that hydraulic dredging operations on the Kansas River have very little impact on water quality parameters. Suspended solids, toxic chemicals and heavy metals were routinely measured downstream of dredging operations and no significant increases, related to dredging operations, were detected.

Shortly after implementation of the fishery study, it became apparent to KCD that it would need certain social, economic and additional environmental data in order to complete its evaluation of the dredging issue. Burns and McDonnell (Engineers-Architects-Consultants) was awarded a contract in the summer of 1979 to complete a report entitled, "Cumulative Impacts of Commercial Dredging on the Kansas River, A Social, Economic and Environmental Assessment." The report was completed in the spring of 1982.

The purpose of the Burns and McDonnell report was to identify and evaluate the social, economic and environmental aspects of commercial dredging operations on the Kansas River and to examine possible alternatives to current dredging operations. The report mainly consists of a composite of information derived from previously existing literature sources. A large volume of information has been presented in the document, however, much of the information is now outdated or has been superseded by later reports.

The Period 1980 to 1989

In the summer of 1983 KCD awarded a contract to Simons, Li, and Associates to prepare a report entitled, "Analysis of Channel Degradation and Bank Erosion in the Lower Kansas River." The report was prepared in response to criticism from the Kansas Aggregate Producers Association concerning the findings of KCD's 1977 draft dredging report, and was intended to resolve various issues presented by commercial dredging concerns regarding the probable cause for channel degradation, channel widening and bank erosion in the lower Kansas River. The report was completed in the summer of 1984 and provides a quantitative analysis of bed degradation and bank erosion which

may be the result of natural occurrences, commercial sand and gravel extraction, modification of the flow regime and sediment transport rates by Federal reservoirs, the navigation channel and bank stabilization development of the Missouri River, and other activities of man on the Kansas River. The following conclusions from the report are in general agreement with the conclusions drawn in KCD's 1977 draft report:

> "Sand and gravel dredging appears to be the primary cause of the bank erosion and channel widening in the lower 30 miles of the Kansas River. Significant quantities of material have been removed from the channel bed in this reach during the past 50 to 75 years. Between 1952 and 1976, for example, approximately 49.3 million tons of material were dredged between Turner Bridge and Bonner Springs, which corresponds to an average thickness of approximately 15 feet within the main channel. Sediment continuity indicates a direct relationship between the dredging activity and channel degradation and bank erosion. As evidenced by the approximately 8 to 15 feet of degradation and 150 feet of channel widening between Turner Bridge and Bonner Springs, available data show areas within the lower Kansas River which have undergone the most severe degradation are the same locations where extensive dredging has taken place."

Shortly after completion of the Simons, Li, and Associates report, KCD provided all interested parties with a 60-day comment period to review the 3 reports that had been contracted out by the District to address various issues concerning commercial dredging activities on the river. Those reports included the fishery study, the Burns and McDonnell report and the Simons, Li, and Associates report. Mr. Smith, who was originally retained by the Kansas Aggregate Producers Association to review KCD's 1977 draft report, was once again retained by the producers to review the Simons, Li, and Associates' report.

Mr. Smith maintained his previous position concerning the influence of the Federal reservoir system on the stability of the lower Kansas River channel and minimized the impacts attributed to dredging in the Simons, Li, and Associates report. In addition to the comments provided by Mr. Smith, the Kansas Aggregate Producers Association expressed their concern that the Burns and McDonnell report does not document its claim that commercial dredging activities have resulted in physical damage to pipelines, bridges and other structures along the river. The U.S. Fish and Wildlife Service noted that information contained in the Burns and McDonnell report may now be outdated. No other comments were received.

By the fall of 1984 it had become apparent to KCD that the

future regulation of commercial dredging operations on the Kansas River would be extremely complex and that a comprehensive plan would be needed to regulate this activity in order to best serve the public interest involved. This conclusion was based on the following factors:

1. Past commercial dredging activities on the river have had a severe impact on the river's morphology and ecology and on nondredging interests located in and along the river. Future dredging activities have a high potential to worsen existing problems and to extend dredging impacts into previously undisturbed reaches of the river.

2. The quantity of sand and gravel extracted from the heavily dredged reach of river downstream of river mile 22 has far exceeded the natural replenishment of those materials by the river. An examination of the 5-year period from 1979 through 1983 illustrates the trend. During that period, the average annual rate of sand and gravel extraction was approximately 2.38 million tons downstream of river mile 22, and the average annual quantity of sand transported into that reach by the river was approximately 1.67 million tons (based on 1935 through 1974 flow duration curves at De Soto). The quantity of sand and gravel extracted for that 5-year period exceeded the quantity of sand transported into that reach by approximately 3.55 million tons and exceeded the quantity of material trapped in the reach by significantly more than 3.55 million tons. If dredging operations downstream of river mile 22 are allowed to continue extracting sand and gravel at an annual rate in excess of the natural replenishment rate of the material, it would result in continued riverbed degradation and could precipitate additional bank erosion and channel widening in that reach. In addition, such dredging would probably exacerbate bed degradation, bank erosion and channel widening in the approximately 9-mile-long reach of river extending from Bonner Springs upstream to De Soto, and could ultimately impact the entire reach downstream of Bowersock Dam.

3. The reach of river downstream of river mile 22 is nearly depleted of commercially desirable materials, which are ancient deposits that consist of gravel and relatively coarse fractions of sand. The majority of the producers operating within this reach will probably run out of desirable materials in the near future and are expected to request authorization to move into the undredged reach of river upstream of Bonner Springs. If the producers are allowed to move into the undredged reach of river, and if they are allowed to operate with no restrictions on the quantity of material that can be extracted, the impact of those operations on the new reach would be similar to and possibly worse than the impacts that have occurred downstream of river mile 22. In addition, the reaches of river upstream and downstream of the new reach being dredged would probably experience a significant increase in riverbed degradation, bank erosion and possibly channel widening.

4. Very little information is available to assess the stability of Bowersock Dam. The unrestricted removal of sand and gravel from the reach of river immediately downstream of the dam, and/or the cumulative impacts of unrestricted sand and gravel removal from the lower river, could degrade riverbed elevations immediately downstream of the dam which could lead to failure of the structure.

5. A continuous long-term decline in riverbed elevations has been observed where dredging activities are concentrated in the Topeka area. If the rate of sand and gravel extraction in the Topeka area continues at the recent average annual rate of removal (approximately 400,000 tons annually between 1964 and 1984), riverbed degradation will continue to worsen and impacts may extend upstream and downstream into previously unimpacted areas.

6. The impacts associated with commercial dredging activities on the river could be limited by restricting the quantity of sand and gravel that can be extracted. However, nothing less than a total cessation of dredging would be expected to entirely eliminate adverse impacts upstream of river mile 22. The sand transport rate 1/ in and out of most reaches of the river upstream of river mile 22 is approximately 1:1. Those reaches of river are essentially in equilibrium, since the quantity of sand transported into a reach is approximately equal to the quantity transported out of the same reach. Therefore, the removal of any quantity of sand and gravel upstream of river mile 22 has a potential to impact the river channel's stability. The heavily dredged reach of river downstream of river mile 22 has a relatively high sand trapping efficiency 2/, due to the backwater effect of the Missouri River and the Water District No. 1 weir, and due to sluggish flows in the deeply incised channel formed from decades of sand and gravel extraction. Under current conditions, this reach of river does not allow as much sand to be transported out as is transported in from the upstream reach. If the quantity of material extracted from this reach does not exceed the quantity of material trapped (some amount less than 1.67 million tons annually), no significant additional impacts should occur. However, if the quantity of material extracted exceeds the quantity of material trapped in the reach, significant dredging-related impacts could continue to occur. The magnitude of those impacts would depend upon the rate of sand and gravel extraction.

1/ The term sand transport rate refers to the quantity of sand transported downstream by the river, past a given point, over a specified period of time.

2/ The term sand trapping efficiency refers to the ability of a given reach of river to retain the sand transported into that reach from upstream.

Due to the need for a comprehensive plan to regulate commercial dredging activities on the river, KCD requested Simons, Li, and Associates to prepare a report entitled, "Recommendations for a Plan to Regulate Commercial Dredging on the Kansas River." The report was initiated in the winter of 1984 and was completed and provided to interested parties in the fall of 1985. Prior to the initiation of work on the report by the contractor, KCD invited the Kansas River sand and gravel producers and all other interested parties to meet with KCD and the contractor to help formulate the objectives of the proposed regulatory plan.

The completed report addresses the lower river and the Topeka area and presents recommendations and pertinent data to be used by KCD in its preparation of a regulatory plan. The document provides: (a) five possible future sand and gravel extraction rates for the river and examines potential riverbed degradation/aggradation associated with each rate; (b) a level (value) of impacts associated with each of 4 depths of riverbed degradation (0 - 2.5 feet, no impacts; 2.5 - 5.0 feet, minor impacts; 5.0 - 8.0 feet, moderate impacts; and greater than 8 feet, major impacts); (c) a monitoring proposal to identify the impacts associated with future dredging activities; and (d) a list of structures (pipelines, bridges, islands, etc.) and the buffer (undredged) zone recommended between a working dredge and each structure.

In the fall of 1985 a scoping meeting was held to solicit comments from all interested parties prior to the preparation of an EIS. Comments provided to KCD in response to the scoping meeting addressed a number of issues which ranged from environmental concerns to economic concerns. The most frequently expressed concerns related to economics and especially, to the impacts which may occur to the dredging industry if dredging activities are significantly reduced or entirely eliminated from the river.

Later in the fall of 1985, KCD determined that it needed additional economic information in order to address potential impacts which may occur to the producers or the sand and gravel market if sand and gravel extraction from the Kansas River is significantly reduced or entirely eliminated. Booker (Engineers-Architects-Planners) was awarded a contract that fall to prepare an economic report entitled, "Kansas River Dredging Operations - Baseline Study and Comparison of Alternatives." The report was completed in the winter of 1986. It compares investment and operating costs of existing Kansas River dredging operations against the costs associated with a move to pit operations in the Kansas River's flood plain or to the Missouri River.

The Booker report states that dredging on the Kansas River is the most cost effective method of sand and gravel production among the 3 alternatives examined. The report states that pit mining in the Kansas River's flood plain is an economically viable alternative for most Kansas River dredging operations.

The report further states that a move from the river to the flood plain would increase the average delivered price of a ton of sand and gravel approximately 6 percent. The report concludes that Missouri River dredging is the most costly of the 3 alternatives and notes that Missouri River dredging would not be economically viable for firms producing less than 500,000 tons of material annually.

In the winter of 1986 the producers operating on the lower Kansas River collectively provided KCD with a letter commenting on Simons, Li, and Associates second report and on future dredging regulations for the river. The primary concerns expressed by the producers are (a) the need for a 5-year transition period to allow the producers to move from the Kansas River to other material sources, if dredging operations on the river are significantly restricted or entirely eliminated and (b) the need to treat the lower river as a single reach if annual sand and gravel extraction limits are imposed so that all producers could compete equally for available material until the limit is reached.

In the winter of 1986 KCD determined that as little as 2 - 3 feet of additional riverbed degradation in the lower Kansas River and in the Topeka area would result in millions of dollars in economic losses to nondredging concerns 1/. Lower riverbed and water surface elevations would increase: (a) bank erosion (loss of property), (b) maintenance of bank stabilization structures, (c) well field operating costs (lower water surface elevations in the river mean lower water table elevations in the flood plain), (d) water supply costs (where lower water surface elevations in the river inhibit the operation of water intakes), and (e) pipeline and bridge maintenance. The greatest economic losses incurred by nondredging concerns would be the costs associated with the repair of damaged bank stabilization structures.

The Kansas City District awarded a contract to Burns and McDonnell (Engineers-Architects-Consultants) in the spring of 1986 to prepare 3 additional reports needed to address commercial dredging activities on the Kansas River. The reports were completed in the spring of 1987 and were provided to interested parties at that time. The titles of the 3 reports are as follows:

1. "Kansas River Valley Groundwater Impact Investigations for the Regulatory Plan - Commercial Sand and Gravel Dredging - Kansas River."

1/ The term nondredging concerns refers to public or private parties which have a material interest in manmade structures, land or other possessions located in or along the Kansas River.

2. "Kansas River Water Intake Investigations for the Regulatory Plan - Commercial Sand and Gravel Dredging - Kansas River."

3. "Kansas River Flood Plain Sand and Gravel Investigations for the Regulatory Plan - Commercial Sand and Gravel Dredging - Kansas River."

The groundwater impact report examines potential impacts to groundwater users, if the Kansas River's bed is lowered 1, 3 or 5 feet between Eudora (near river mile 42) and the confluence of the Kansas and Missouri Rivers. The report states that lower groundwater elevations, resulting from lower riverbed elevations, would reduce well yields in several of the cases examined. The report also states that in all of the cases examined, lower groundwater elevations would result in increased well operation pumping costs.

The water intake investigation report examines potential impacts to raw water supplies at intakes operated by the Sunflower Army Ammunition Plant (intake located near river mile 32.9) and Water District No. 1 of Johnson County (intake located located near river mile 15) if the Kansas River's bed is lowered 1 - 5 feet. The report states that hydraulic calculations of pumping systems at both intakes indicate that insufficient suction head conditions exist for proper pump operation at low flow stages. The report concludes that additional channel degradation in excess of 1 foot near the Water District No. 1 intake would worsen pumping capabilities at the intake. It also concludes that any additional degradation at the Sunflower intake would worsen pumping capabilities at that intake. In addition, 2 or more feet of degradation near the Sunflower intake would eliminate the possibility of pumping operations at low flow stages.

The flood plain sand and gravel investigation report examines the quantity and quality of alluvial sand deposits in the lower Kansas River's flood plain and the depths of overburden associated with those deposits. The report shows that materials suitable for sustaining pit mining operations are generally available in the lower river's flood plain.

In the spring of 1987 KCD evaluated all of the information it had collected in over a decade of analyzing commercial dredging activities on the Kansas River. The following pertinent information became apparent:

1. The 1967 U.S. Geological Survey report concludes that commercial dredging activities are the primary cause of riverbed degradation in the lower Kansas River. The 1977 KCD draft report and the 1984 Simons, Li, and Associates report conclude that commercial dredging activities are the primary cause of riverbed degradation, bank erosion, and channel widening in the lower river.

2. The Kansas City District's analysis of dredging-related impacts on the Kansas River has concluded that as little as 2 to 3 feet of additional riverbed degradation in the lower river and in the Topeka area would result in millions of dollars in economic losses to nondredging concerns along the river.

3. The 1986 Burns and McDonnell flood plain sand and gravel report concludes that materials suitable for sustaining pit mining operations are generally available in the lower Kansas River's flood plain. (Although the Burns and McDonnell report does not address sand deposits in the flood plain upstream of Bowersock Dam, KCD is aware that pit mining operations exist upstream of the dam, and therefore, assumes that suitable materials are generally available within the upper river's flood plain.)

4. The 1986 Booker report concludes that commercial dredging operations currently working on the Kansas River could relocate to pits in the river's flood plain with minimal impact to the producer companies or to consumers.

Based on these findings, KCD departed from its earlier tentative position to allow future limited dredging activities to occur on the Kansas River by proposing that all future dredging activities on the river should be terminated. The Kansas City District met with the producers in the spring of 1987 to discuss a proposal by the District to eliminate all commercial dredging operations from the river within 5 years of completion of the EIS. The producers were informed that the proposal would be presented as the selected alternative in the draft EIS. The producers responded to KCD's proposal by informing the District that the state of Kansas was proposing legislation that would limit certain activities in the flood plain, which would include pit mining operations in order to protect groundwater supplies from contamination. The producers also informed the District that, based on recent experience, obtaining suitable land in the lower river's flood plain for pit mining and meeting local zoning requirements may significantly limit the potential number of future pit mining operations in the flood plain.

Subsequent to the 1987 spring meeting with the producers, KCD obtained additional information that supports the producers' position concerning the potential difficulty involved in relocating dredging operations from the river to pits in the flood plain. The difficulty in obtaining land and meeting zoning requirements appears to be related to the following factors:

1. The flood plain adjacent to the lower 23 miles of the Kansas River is largely urbanized or industrialized and, is therefore, inordinately expensive to purchase for pit mining operations.

2. It appears that many of the landowners in the flood plain along the lower Kansas River do not wish to break up large land holdings (a pit mining operation requires 50 - 100 acres of land) or do not wish to sell prime farmland or land that has been a family holding for many generations.

3. Zoning for pit mining operations in the lower Kansas River's flood plain can be very difficult or impossible to obtain due to objections from residential areas, protection of potential industrial building sites, or concerns regarding groundwater impacts.

In response to the latest findings concerning pit mining operations in the lower Kansas River's flood plain, as an alternative to dredging in the river, KCD revised its position concerning the elimination of all future commercial dredging activities on the river. The Kansas City District now proposes to allow limited dredging activities to occur on the river and has prepared a comprehensive "Regulatory Plan" to aid the District in its administration of permit applications for such dredging. The Plan is intended to limit the adverse impacts associated with commercial dredging activities on the Kansas River to an acceptable level.

The Regulatory Plan incorporates the selected alternative presented in this report.

VI. PROBLEM IDENTIFICATION

Riverbed degradation is the direct or primary adverse impact resulting from commercial dredging activities. Riverbed degradation creates an unstable river channel which results in secondary impacts such as bank erosion, channel widening, lowering of water surface elevations in the river channel, lowering of water table elevations adjacent to the river, alteration of aquatic and terrestrial habitat, and a reduction in the structural integrity of manmade structures. The magnitude of secondary impacts is essentially a function of the amount of riverbed degradation. Therefore, as riverbed degradation increases so does instability of the river channel and the magnitude of secondary impacts.

The primary and most significant secondary impacts resulting from commercial dredging activities on the Kansas River can be grouped into three principle impact categories. The three categories of impacts are: (a) morphologic (physical changes to the river channel); (b) ecologic; and (c) economic (impacts to manmade structures, land, water supplies, etc.). Other categories of impacts have been identified such as esthetic and recreational; however, those impacts are relatively minor when compared to the three principle impact categories listed above

and are not discussed in this report.

Morphological Impacts

The effects of commercial dredging activities on the river channel's morphology have been recorded by various observers and are discussed in many of the reports referenced in this document. The 1967 USGS report, the 1977 KCD draft report, the 1982 Burns and McDonnell report and the 1984 Simons, Li, and Associates report all describe significant changes in the Kansas River channel's morphology, which have occurred as a result of commercial dredging activities.

Both the U.S. Geological Survey report and the Kansas City District's draft report cite a significant reduction in stage in the lower Kansas River and attribute the declining water surface elevations primarily to degradation of the river channel by commercial dredging activities. The Kansas City District's draft report also notes a significant decrease in stage at Topeka and attributes that reduction in water surface elevations primarily to dredging activities. Both reports describe a significant decrease in stage at a USGS gauging station near Bonner Springs. The U.S. Geological Survey report states that the stage at their gauging station near Bonner Springs decreased more than 5 feet from 1933 to 1965, and that half of that decrease occurred in the 13-year period from 1952 to 1965. The Kansas City District's draft report notes that the stage at the gauge began to drop .35 - .40 feet per year in 1952 and continued to drop until the gauge was relocated in 1973. The history of the gauging station reflects the rapidly declining water surface elevations near the gauge. The gauge was established in 1917 on the site of the present day K-7 Highway Bridge near Bonner Springs. The gauge was lowered 6 feet in 1960 to accommodate lowering water surface elevations and was lowered 5 more feet in 1971. The gauge was finally relocated to a more stable reach of river at De Soto in 1973.

The U.S. Geological Survey report states that data indicate that the low discharge stage in the 11-mile-long reach of river between Bonner Springs and Turner Bridge lowered an average of 2.6 feet from 1952 to 1965, and that a decrease in stage extends to the mouth of the river. The Kansas City District's draft report states that the stage in the reach of river between Bonner Springs and Turner Bridge dropped as much as 8 feet from 1954 to 1971. The draft report also states that the stage at Topeka dropped 1.5 feet from 1950 to 1976. The draft report notes that a significant long-term decline in water surface elevations is only recorded at Topeka and Bonner Springs, and further notes that these are the only two areas on the river where dredging activities are concentrated and where significant quantities of material are being extracted. The

1984 Simons, Li, and Associates report is in general agreement with the USGS and KCD findings concerning changes in the low flow stages in the river over the last several decades.

The declining water surface elevations in the lower Kansas River and at Topeka reflect decreasing riverbed elevations and/or increasing channel widths. The Kansas City District's draft report states that channel cross-sections taken between De Soto and Turner Bridge from 1954 to 1977 show that the channel has deepened significantly, and that it has widened 50 - 350 feet. The report also states that the cross-sections indicate that the channel has widened approximately 25 percent since the early 1960s. The 1984 Simons, Li, and Associates report states that the reach of river between Bonner Springs and Turner Bridge has degraded 8 - 15 feet and has widened approximately 150 feet, primarily as a result of dredging activities. The report notes that the areas in the lower river that have undergone the most severe degradation are the same areas in which extensive dredging has taken place.

Ecological Impacts

Ecological impacts resulting from commercial dredging activities on the Kansas River are essentially a function of changes in channel morphology and are mainly influenced by riverbed degradation, bank erosion and channel widening. The effects of dredging activities on the ecology of the river and its adjacent land are not as well understood as are the effects of dredging on the morphology of the river channel. This is due to the difficulty in measuring the effects of changes in channel morphology on the myriad of aquatic and terrestrial plant and animal species found in and along the river, and to the complex interrelationship of those species to one another and to their physical surroundings. Generally, the effects of changes in channel morphology on the biological community are closely related to the magnitude of channel change. Therefore, as degradation, erosion and channel widening increase, so do impacts on plants and animals.

Riverbed degradation has a high potential to impact the biological community. Lowering of the riverbed promotes bank erosion and channel widening which in turn impact aquatic and terrestrial plants and animals. Bed degradation may increase water depths and slow flow velocities as it has done in the reach of river downstream of river mile 22, and/or it may increase flow velocities upstream of a degraded reach by increasing the channel's gradient. Each of these physical changes to the river channel has a high potential to impact aquatic life. When riverbed degradation produces deeper, slower moving water, it can result in rapid siltation which significantly changes the river's substrate. Deeper, slower flows and silty substrate make conditions intolerable for many

indigenous fish and benthic invertebrates, which allows a shift to life more typically adapted to lake-like conditions. This phenomenon is exemplified in the heavily dredged reach of river downstream of river mile 22. Dredging activities in that reach have deepened and widened the river, flow velocities have been substantially reduced and silt overlies much of the once sandy riverbed. The shift from a relatively shallow, fast flowing, sandy, braided channel to a deep, sluggish, silty channel, with significantly reduced habitat diversity, has altered the species composition of the fishery by reducing the number of fish species and the total number of fish. When riverbed degradation increases the channel's gradient upstream of a degraded reach, a less stable channel is formed. The increased gradient accelerates flow velocities which may result in increased scour, bank erosion and channel widening. Each of these physical changes will in turn affect the biological community. Riverbed degradation may lower water surface elevations in the river channel which could lower the water table in the flood plain along the river. Reduced water table elevations could in turn adversely impact wetlands in the flood plain. The magnitude of such impacts would depend upon the amount of degradation in the river and its affect on water table elevations in the flood plain.

Bank erosion has a high potential to impact the biological community. Bank erosion impacts aquatic organisms by increasing suspended solids concentrations in the river which reduce light transmission and increase siltation. Erosion adversely impacts wildlife populations by destroying riparian habitat. Some reaches of the Kansas River have only a narrow band of uncleared land along their banks and, when erosion destroys these fringe areas, a large number of birds, mammals, and other terrestrial animals lose critical habitat. When this occurs, their presence along the river is diminished. Bank erosion may also result in channel widening.

Channel widening also has a high potential to impact the biological community. Channel widening is a product of bank erosion, and its effects on plant and animal life are similar to the effects associated with riverbed degradation. Channel widening increases the river's cross-sectional area and therefore, may reduce flow velocities and increase siltation.

Limited dredging activities may benefit the river's biological community by increasing habitat diversity. The University of Kansas fishery report prepared for KCD, states that moderate rates of sand and gravel extraction increase habitat diversity in the typically shallow, relatively fast flowing, braided river channel by creating pools with deeper, slower moving flows. The report further states that excessive individual and/or cumulative rates of sand and gravel extraction, such as in the reach of river downstream of river mile 22, reduce habitat diversity and adversely impact the river's fishery by creating long reaches of river with relatively deep, sluggish flows and a silty substrate.

Economic Impacts

Economic impacts (physical damage) occurring to nondredging interests in and along the Kansas River, as a result of commercial dredging activities, are primarily related to changes in channel morphology and are mainly influenced by riverbed degradation, bank erosion and channel widening. Generally, the magnitude of changes in channel morphology determines the magnitude of damages to nondredging interests. Therefore, as riverbed degradation, bank erosion and channel widening increase so do damages. Nondredging interests with a high potential to be impacted by dredging operations include manmade structures, land adjacent to the river, and water supplies.

Riverbed degradation is the primary cause of dredging-related impacts to manmade structures and water supplies. Riverbed degradation also promotes bank erosion and channel widening, which in turn impact manmade structures, water supplies and land adjacent to the river. Bed degradation undermines bridge piling and piers, and exposes pipelines buried in the riverbed. Unstable bridge piling and piers must be restabilized and exposed pipelines must be reburied or secured to the riverbed in order to prevent failure of the structures. Bed degradation also undermines bank protection structures such as dikes, jetties, hardpoints and revetments. Slumping of bank protection works increases bank erosion, which results in a loss of public and/or private land and necessitates costly repairs to the structures if further losses are to be avoided. In addition, bed degradation undermines water intake diversion jetties and weirs. Slumping of these structures lowers water surface elevations at water intakes and reduces or eliminates water intake pumping capabilities during periods of low river stage, unless the structures are repaired. Lowering of the riverbed directly impacts (lowers) water surface elevations in the river channel, which lowers water table elevations in the flood plain. Lower water surface elevations in the river channel and lower water table elevations in the flood plain have a high potential to adversely impact water intake and well field productivity, especially during low flows. When water intake production is impacted by riverbed degradation, a water supplier must construct new or elevate existing diversion jetties or weirs, or modify intake facilities to ensure adequate water supplies. When well field operations are impacted by riverbed degradation, a water supplier may need to increase maintenance (acid treatments to maintain peak pumping capabilities) or construct additional wells. In addition, lower groundwater elevations result in higher pumping costs due to higher pumping heads which increase power usage.

Bank erosion impacts land resources and manmade structures located on and near the riverbank. Bank erosion can also result in channel widening, which may in turn impact water

supplies. Channel widening increases the cross-sectional area of the river, which can result in reduced water surface elevations in the river channel and reduced water table elevations in the flood plain. When channel widening lowers water surface elevations in the river, it creates impacts to water supplies which are similar to those occurring from riverbed degradation.

Commercial dredging activities on the Kansas River have, over the course of many years, resulted in substantial economic impacts to nondredging concerns, especially in the reach of river downstream of river mile 22. Dredging-related riverbed degradation, bank erosion and channel widening have impacted manmade structures, water supplies and land resources. Structures impacted by dredging activities include the Water District No. 1 weir near river mile 15, the Atchison, Topeka, and Santa Fe Railway Company Bridge near river mile 21.2 and various pipelines located in the riverbed. The massive water intake weir built and maintained by Water District No. 1 of Johnson County was originally constructed in response to declining water surface elevations resulting from riverbed degradation and has been rebuilt several times in response to continued bed degradation. Riverbed degradation near Bonner Springs has exposed the wooden piling under three of the piers supporting the Atchison, Topeka, and Santa Fe Railway Company's bridge. Sheet piling filled with grout have been placed around the exposed piling and piers to stabilize the bridge. The riverbed near the bridge is so degraded that local scour from a 100-year flood event could cause the structure to fail. Various pipelines passing through the lower river channel have been exposed as a result of riverbed degradation. Exposed lines have either been reburied or secured to the riverbed with ballast. In addition, bank erosion and channel widening have impacted land resources along the lower river.

Estimates of potential future economic losses to nondredging concerns from dredging-related damages to manmade structures, water supplies and land resources have been compiled by KCD. The economic impacts to bank stabilization structures, bridges, pipelines, wells, water intakes and associated weirs and jetties, and land along the Kansas River are estimated for 1 - 5 feet of riverbed degradation. The largest category of potential economic losses has been identified as impacts to bank stabilization structures. Potential dredging-related damages to bank stabilization structures in the lower river between river miles 8.2 and 50.4 range from $774,000 for 1 foot of riverbed degradation to $4,184,000 for 5 feet of bed degradation. Damages to bank stabilization structures in the Topeka area between river miles 84 and 87.7 range from $212,000 for 1 foot of riverbed degradation to $1,144,000 for 5 feet of bed degradation.

The estimated total potential damage to manmade structures, water supplies and land resources for 1 foot of riverbed degradation in the lower Kansas River is $791,700 for permanent

losses 1/ and capital costs 2/, and $29,900 for increased annual costs 3/. The estimated total potential damage in the Topeka area for 1 foot of riverbed degradation is $214,100 for permanent losses and capital costs. No increase in annual costs would be reflected in the Topeka area for 1 foot of bed degradation. The estimated total potential damage for 5 feet of riverbed degradation in the lower river is $5,803,000 for permanent losses and capital costs, and $79,700 for increased annual costs. The estimated total potential damage in the Topeka area for 5 feet of riverbed degradation is $1,418,400 for permanent losses and capital costs. No increase in annual costs would be reflected in the Topeka area for 5 feet of bed degradation.

The estimated potential economic losses presented in this report are based on conservative estimates of potential impacts to nondredging interests and reflect minimum foreseeable losses. For example, when several alternative methods are available to restore the function of an impacted structure, the least costly alternative has been factored into the losses presented in this report. However, the actual method selected to restore a structure's function may not be the least costly alternative. For instance, 5 feet of additional riverbed degradation adjacent to the Olathe well field would substantially impact well field output during low flows. Several alternatives would be available to the city to restore lost pumping capabilities. The city could increase energy usage and modify its well field operation, at an annual cost of $11,800; it could increase the number of wells, at a capital cost of $252,000 and an annual cost of $1,900; or it could increase energy usage and purchase additional water, at an annual cost of $50,700. A similar situation exists for wells operated by Water District No. 1 of Johnson County, the city of Bonner Springs, the city of De Soto, the Sunflower Army Ammunition Plant, and industrial and farming concerns.

Certain potential economic losses have not been included in the losses presented in this report. For example, future structures located in and along the river could be impacted by commercial dredging activities, which would result in economic losses in excess of those presented in this report. Also, impacts to structures such as Bowersock Dam and the Sunflower

---

1/ The term permanent losses refers to irreparable damages, such as the loss of land from erosion.

2/ The term capital costs refers to the costs associated with nonroutine work, such as a one-time repair of a damaged bank stabilization structure or construction of a new well.

3/ The term annual costs refers to the costs associated with routine work, such as periodic repairs to bank stabilization structures or periodic acid treatments for wells.

Army Ammunition Plant water intake facility have not been factored into the losses presented in this report, since such losses cannot be estimated at this time. Sufficient information is not available to determine how many feet of additional riverbed degradation would cause failure of Bowersock Dam. Therefore, potential economic losses associated with failure of the structure have not been presented here. The Sunflower Army Ammunition Plant's water intake is currently unable to meet emergency Army mobilization needs during low flows. Since the Army has not determined whether it will take any action to remedy the problem, potential economic losses associated with additional riverbed degradation have not been presented here.

VII. ALTERNATIVES

Various alternatives have been examined to resolve the issues relating to commercial dredging activities on the Kansas River. The economic importance of Kansas River sand and gravel and the dependence of various construction industries on the product must be weighed against the morphologic, ecologic, and economic damages that may result from continued sand and gravel dredging activities on the river. The following alternatives have been considered:

No Action

The No Action alternative would allow commercial dredging operations on the Kansas River to continue dredging under the limited restrictions imposed in the past. This alternative would allow unlimited sand and gravel extraction from the river and would not adversely impact the sand and gravel industry or its market. Implementation of the No Action alternative would result in continued unacceptable dredging-related riverbed degradation, bank erosion and channel widening in previously impacted reaches of the river and would extend undesirable impacts into previously unimpacted areas, as dredging operations expand into new undisturbed reaches of the river. Since the No Action alternative would result in continued unacceptable dredging-related impacts to the river's morphology and ecology and to nondredging interests located in and along the river, the alternative has been eliminated from further consideration.

Cessation of Dredging

The Cessation of Dredging alternative would eliminate all

future commercial sand and gravel dredging operations from the Kansas River. A cessation of dredging activities on the river could severely disrupt the sand and gravel industry and its market. The producers would be forced to exploit more costly sources of material, such as the Kansas River's flood plain and the Missouri River. Implementation of this alternative would eliminate all future dredging-related impacts to the river's morphology and ecology and to nondredging interests located in and along the river. However, since suitable restrictions could be imposed to limit dredging-related impacts to an acceptable level, this alternative has been eliminated from further consideration.

Restricted Dredging

Restricted Dredging has been selected as the alternative best suited to satisfy the public interest relating to the various issues presented in this report. This alternative represents a compromise between the extremes of the No Action and Cessation of Dredging alternatives. The restrictions presented in this alternative and adopted for incorporation into the Regulatory Plan are expected to reduce dredging-related impacts to an acceptable level. Due to the large number of potential restrictions examined, only those restrictions accepted for inclusion in the Plan, and a single rejected potential restriction, are presented here.

Restrictions Concerning Riverbed Degradation. Riverbed degradation is the direct or primary adverse impact resulting from commercial dredging activities on the Kansas River. Riverbed degradation creates an unstable river channel which results in many undesirable secondary impacts. Riverbed degradation and its associated secondary impacts, such as bank erosion and channel widening, adversely affect the river's morphology and ecology and nondredging interests located in and along the river. Restricting the amount of bed degradation would significantly reduce dredging-related impacts.

The impacts that would occur if 1 - 5 feet of additional riverbed degradation is allowed have been examined, and 2 feet has been determined to be the maximum amount of additional bed degradation that will be allowed. The additional 2 feet of riverbed degradation will be measured as an average through any 5-mile-long reach of river, and will be computed by subtracting future riverbed elevations and/or water surface profiles from base line data collected soon after implementation of the Regulatory Plan. Restrictions that would allow riverbed degradation in excess of 2 feet have been rejected due to the magnitude of potential damages (economic losses) that could occur to nondredging interests in and along the river. Restrictions that would limit riverbed degradation to less than 2 feet are not considered feasible, due to the difficulty in

monitoring such a small change in bed elevations.

Restrictions Concerning the Rate of Sand and Gravel Extraction from Specified Reaches of the River. The rate of sand and gravel extraction from a reach of river is an important factor affecting the river channel's stability. River channel stability decreases as the rate of extraction increases. Therefore, greater channel stability can be obtained by restricting the rate of extraction from a reach of river, in order to provide a reasonable period of time for the river to adjust to declining river bed elevations. Due to substantial morphologic differences between certain reaches of the river, and due to differences in the level of protection necessary to ensure the integrity of certain structures located in the river, separate sand and gravel extraction rates will be established for each of the following reaches:

1. The Confluence of the Kansas and Missouri Rivers to the Atchison, Topeka and Santa Fe Railway Company Bridge at Bonner Springs (River Miles 0 - 21.2 (Approx.)). The annual rate of sand and gravel extraction within this approximately 21.2-mile-long reach of river will be restricted to 1 million tons. This quantity of material is considered a safe limit for the reach since the reach has a high sand trapping efficiency which results in the retention of much of the approximately 1.67 million tons of sand transported into it annually. An annual extraction rate of 1 million tons of material will be approximately one third of the average annual extraction rate for this reach during the last 4 recorded years (1984 through 1987), and will be less than half of the average annual extraction rate for this reach over the last several decades.

An additional restriction will be imposed within this reach of river to minimize potential impacts to the Water District No. 1 weir, located near river mile 15.0. The annual rate of sand and gravel extraction between river mile 12.4 (the upstream end of a natural rock deposit) and the water District No. 1 weir will be 300,000 tons. This restriction is based on professional judgment and is intended to minimize potential impacts to the weir by restricting the rate of riverbed degradation downstream of the structure.

2. The Atchison, Topeka and Santa Fe Railway Company Bridge at Bonner Springs to River Mile 48.0 (River Miles 21.2 (Approx.) - 48.0). The annual rate of sand and gravel extraction for any 15-mile-long section of river located within this approximately 26.8-mile-long reach of river will be restricted to 750,000 tons (an average of 50,000 tons of material per mile). This restriction is based on the observed response of the river channel in the Topeka area to the average annual extraction of approximately 40,000 tons of material per mile over a 20-year period. The reach of river through Topeka has degraded approximately 1 foot per decade, and it is assumed that a similar response will occur in most reaches of the river located upstream of the railroad bridge near Bonner Springs.

3. River Mile 48.0 to Bowersock Dam at Lawrence (River Miles 48.0 - 51.8 (Approx.)). The annual rate of sand and gravel extraction within this approximately 3.8-mile-long reach of river will be restricted to 150,000 tons. This restriction is based on professional judgment and is intended to minimize potential impacts to the dam by restricting the rate of riverbed degradation immediately downstream of the structure.

4. Bowersock Dam at Lawrence to the Confluence of the Kansas, Smoky Hill and Republican Rivers Near Junction City (Approx. River Miles 51.8 - 170.4)). The annual rate of sand and gravel extraction for any 15-mile-long Section of river located within this approximately 118.6-mile-long reach of river will be restricted to 750,000 tons. Refer to 2. above for the rationale for this restriction.

Restrictions Concerning the Rate of Sand and Gravel Extraction by an Individual Dredge. The rate of sand and gravel extraction by an individual dredge is an important factor affecting local 1/ river channel stability. Local impacts from an individual dredge increase as the dredge's extraction rate increases. Since greater local channel stability can be obtained by restricting the extraction rate of an individual dredge, the annual rate of sand and gravel extraction by a single dredge will be limited to 300,000 tons. This restriction is based on the observed response of the river channel near smaller dredging operations and on professional judgment.

Restrictions Concerning the Distance Between Adjacent Permitted Dredging Boundaries. A single dredging operation impacts local river channel stability. If 2 or more dredging operations are located relatively close to one another, the cumulative affects of those operations may induce significantly greater impacts than the sum of those operations if the dredges are spaced a reasonable distance apart. Therefore, a 2,000-foot-long undredged zone will be required between adjacent permitted dredging boundaries. This restriction has been adopted from Simons, Li, and Associates report entitled, "Recommendations for a Plan to Regulate Commercial Dredging on the Kansas River."

Restrictions Concerning the Number of Dredges Authorized Under the Terms of an Individual Permit. If more than 1 dredge is allowed to operate within an individual permitted reach of river, unacceptable local impacts could occur. The impacts associated with 2 or more working dredges in close proximity to

---

1/ The term local refers to the area directly impacted by a working dredge. This area could be relatively small extending only a few hundred feet from the dredge, or it could be quite large extending many hundreds of feet upstream and/or downstream of the dredge.

one another have been discussed above in Restrictions Concerning the Distance Between Adjacent Permitted Dredging Boundaries. Restricting the number of dredges in an individual permitted reach would reduce potential dredging-related impacts and would be consistent with past dredging practices on the river. Therefore, only one dredge will be allowed to operate within an individual permitted reach of river.

Restrictions Concerning Manmade Structures. Dredging operations working close to manmade structures have a potential to undercut the structures, which can result in severe damage or failure of the structures. A no dredging zone will be established between a working dredge and manmade structures to reduce potential impacts. Manmade structures subject to damage from dredging activities include Bowersock Dam, water intake structures and associated weirs and diversion jetties, bridges, pipelines, bank stabilization structures, and levees. The restrictions established to minimize impacts to these structures are based on recommendations provided in Simons, Li, and Associates report and on professional judgment and experience. Restrictions for manmade structures not identified below will be determined by KCD on a case-by-case basis. The following restrictions will be established:

1. Bowersock Dam. Dredging activities upstream of Bowersock Dam will not be allowed within approximately 750 feet of the dam. The actual distance will be controlled by restriction 6. below, since 2 bridges are located immediately upstream of the dam. Dredging activities downstream of the dam will not be allowed within 2,250 feet of the structure.

2. Water Intake Structures and Associated Weirs and Diversion Jetties. No dredging will be allowed within 500 feet of any water intake structure or an associated weir or diversion jetty. Additional restrictions concerning the Water District No. 1 weir, the Sunflower Army Ammunition Plant water intake structure and diversion jetty, and the city of Topeka water intake structures, diversion jetties and weir are presented in 3 - 5 below.

3. Water District No. 1 Weir. Dredging activities upstream of the Water District No. 1 weir will not be allowed within 500 feet of the structure. Dredging activities downstream of the weir will not be allowed within 2,500 feet of the structure.

4. Sunflower Army Ammunition Plant Water Intake Structure and Diversion Jetty. Dredging activities upstream of the intake structure will not be allowed within 5,000 feet of the structure. Dredging activities downstream of the intake structure will not be allowed within 5,000 feet of the structure. No additional restrictions are necessary in order to protect the intake's diversion jetty.

5. City of Topeka Water Intake Structures, Diversion

Jetties and Weir. No dredging will be allowed between the most upstream diversion jetty and the weir. Dredging activities upstream of the most upstream diversion jetty will not be allowed within 1,000 feet of the structure. Dredging activities downstream of the weir will not be allowed within 2,000 feet of that structure.

6. Bridges. No dredging will be allowed within 500 feet of any bridge crossing the Kansas River.

7. Pipelines. No dredging will be allowed within 200 feet of any pipeline that is buried 10 feet or more below the riverbed's surface. No dredging will be allowed within 500 feet of any pipeline that is buried less than 10 feet below the riverbed's surface.

8. Bank Stabilization Structures. No dredging will be allowed within 200 feet of any bank stabilization structure.

9. Levees. No dredging will be allowed within 150 feet of the riverward toe of any functional levee located along the river.

Restrictions Concerning Natural Formations. Dredging operations working close to natural formations have a potential to undercut the formations which can result in severe impacts. A no dredging zone will be established between a working dredge and important natural formations to reduce potential adverse impacts. Natural formations subject to damages from dredging-induced riverbed degradation include natural rock deposits in the river channel, riverbanks, islands and tributary mouths. The restrictions established to minimize impacts to these formations are based on recommendations provided in Simons, Li, and Associates report and on professional judgment and experience. Restrictions for formations not identified below will be determined by KCD on a case-by-case basis. The following restrictions will be established:

1. Natural Rock Deposit between River Miles 12.2 and 12.4. This rock deposit is an important natural riverbed control. Dredging activities will not be allowed within the reach of river containing the rock deposit (river miles 12.2 - 12.4). Dredging activities upstream of the rock deposit will not be allowed within 500 feet of the deposit. Dredging activities downstream of the rock deposit will not be allowed within 2,500 feet of the deposit.

2. Natural Rock Deposit between River Miles 21.8 and 22.8. This rock deposit is an important natural riverbed control. Dredging activities will not be allowed within the reach of river containing the rock deposit (river miles 21.8 - 22.8). Dredging activities upstream of the rock deposit will not be allowed within 500 feet of the deposit. Dredging activities downstream of the rock deposit will not be allowed in the reach of river located between the deposit and a point

500 feet downstream of the Atchison, Topeka and Santa Fe Railway Bridge (bridge located over the Kansas River near river mile 21.2).

3. Riverbanks. No dredging will be allowed within 300 feet of the ordinary high water mark elevation of any riverbank on the outside of a river bend located in a reach of river which has experienced a significant degree of lateral migration in recent years. No dredging will be allowed within 200 feet of the ordinary high water mark elevation of a riverbank on the outside of a sharp river bend which has a radius of curvature of 4,000 feet or less (provided this restriction is not precluded by the aforementioned 300-foot restriction). No dredging will be allowed within 100 feet of the ordinary high water mark elevation of any riverbank not identified above unless special authorization is granted by KCD.

4. Islands. No dredging will be allowed within 100 feet of the ordinary high water mark elevation of any island. This restriction applies to all islands, including those islands that form within a permitted reach of river after initiation of dredging operations in that reach. No clearing of vegetation will be allowed from any island in the river to facilitate commercial dredging activities.

5. Tributary Mouths. No dredging will be allowed within 100 feet of any tributary mouth.

Restrictions Concerning the Length of Individual Permitted Dredging Operations. The maximum length of any reach of river authorized for dredging under the terms of a single permit is 1.5 miles. This restriction is intended to allow the producers fair access to the river by preventing any producer from using the permitting process to create an unfair advantage over other producers by securing a permit for an excessively long reach of the river.

Restrictions Concerning Water Quality. Restrictions to require dredged return water to pass through a siltation basin prior to its reintroduction to the river, and to require dredged return water to be conveyed from the processing facility to the river by sluiceway or piping have been evaluated. There are no data available to KCD that indicate reintroducing dredged return water directly into the river, without first passing the water through a siltation basin, would adversely impact water quality parameters outside the immediate area of the discharge. However, dredged return water from certain reaches of the river, especially backwater areas in the reach of river downstream of Bonner Springs, could adversely impact water quality parameters. Dredged return water from such areas could contain an inordinately high concentration of silt and possibly toxic substances liberated from the dredged material during processing. Dredged return water discharged directly onto the ground from processing equipment and allowed to flow overland back to the river, in

lieu of conveyance by sluiceway or piping, may also degrade the river's water quality. Dredged return water entering the river as runoff may transport soils, toxic substances and other materials from the plant site to the river. The following restrictions are based on professional judgment and are being established to minimize dredging-related impacts to the river's water quality:

1. A requirement to pass dredged return water through a siltation basin prior to its reintroduction to the river will be considered by KCD on a case-by-case basis. The requirement for a siltation basin may be imposed if substrate conditions or other factors associated with a particular dredge location indicate that a potential water quality problem exists.

2. Dredged return water must be conveyed from the processing facility to the river by sluiceway or by piping.

Restrictions Concerning Fish Spawning. A restriction to prohibit dredging operations on the river during the 1 April to 15 June fish spawning season has been evaluated. The University of Kansas report entitled, "Report on the Impacts of Commercial Dredging on the Fishery of the Lower Kansas River," states that there is no evidence that dredging activities conducted during the fish spawning season prevent adequate recruitment to fish populations in the river. Therefore, this restriction has been eliminated from further consideration.

VIII. REGULATORY PLAN

A Regulatory Plan has been developed to aid KCD in its administration of permit applications for commercial dredging activities on the Kansas River. The Plan incorporates the selected alternative presented in this report (Restricted Dredging) and is intended to limit the magnitude of dredging-related impacts to the morphology and ecology of the river; to manmade structures located in and along the river; and to other public and private interests such as adjacent land, water supplies and recreation. Adverse impacts include: (a) riverbed degradation; (b) bank erosion; (c) channel widening; (d) lowering of water surface elevations in the river channel; (e) lowering of water table elevations adjacent to the river; (f) a reduction in the structural integrity of bridges, pipelines, jetties, dams, weirs and other manmade structures; and (g) a loss of environmental values resulting from (a) through (e).

The adverse impacts that result from commercial dredging activities are being controlled by establishing a maximum acceptable level of adverse impacts and by providing the restrictions necessary to keep impacts at or below the acceptable level. The maximum acceptable level of impacts

established for purposes of the Regulatory Plan is a level which will have only minor effects 1/ on the morphology and ecology of the river and on public and private interests located in and along the river.

The Regulatory Plan is subdivided into 2 main parts which are entitled Dredging Restrictions and Monitoring Program. The Dredging Restrictions consists of criteria developed to limit dredging-related impacts to an acceptable level. The Monitoring Program will utilize data collected from the river to evaluate the impacts associated with restricted dredging in order to ensure that the established maximum acceptable level of impacts will not be exceeded. The producers are responsible for the collection and submittal of all data needed to satisfy requirements of the Monitoring Program. Data collected through the Monitoring Program will be used to quantify the actual rate of riverbed degradation, bank erosion, channel widening, and other parameters affecting the morphology and ecology of the river, and to evaluate related adverse impacts occurring to public and private interests located in and along the river. The data will ultimately be used to adjust the Dredging Restrictions, as needed over time, to assure that the established maximum level of impacts will not be exceeded, and/or to adjust the Restrictions if monitoring efforts reveal that certain constraints can be lessened or eliminated without exceeding the established acceptable level of impacts.

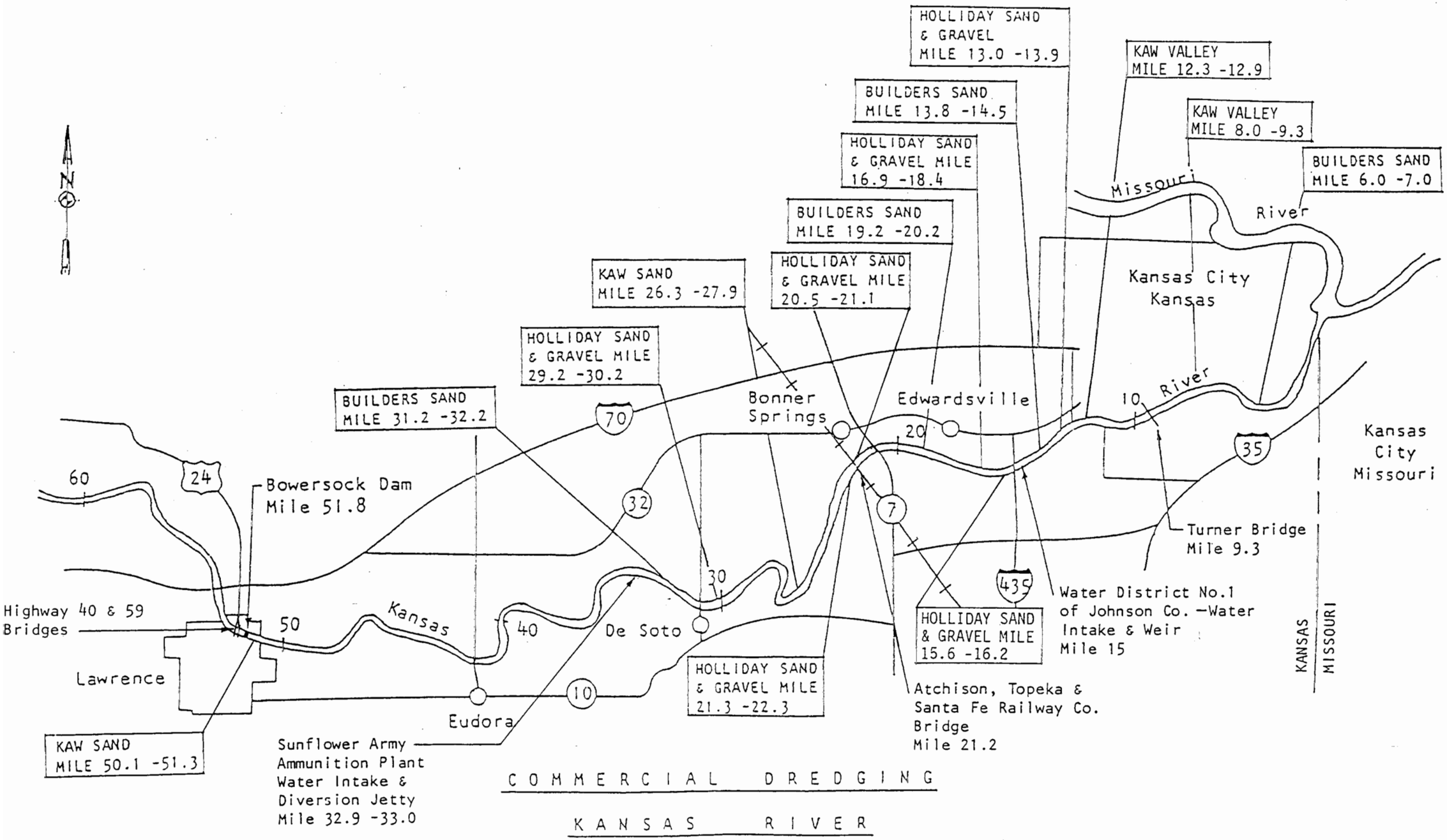
Every effort has been made by KCD to develop the Regulatory Plan through the application of scientific principles. Due to the limitations inherent in predicting future changes in river morphology, some of the elements in the Plan are based upon professional judgment and experience. Development of the Plan has relied on information presented in economic, social, environmental and engineering studies prepared to address this activity; on information provided to KCD by various involved parties; and on the information and experience acquired by KCD over a decade of analyzing Kansas River dredging.

Formulation of the Regulatory Plan has been based on the following objectives: (a) limit the adverse impacts associated with commercial dredging activities to an acceptable level; (b) minimize the economic hardships which may occur to the producers, related construction concerns and consumers; and (c) provide a plan which will treat all producers equitably. Due to the complex nature of the issues relating to commercial dredging activities on the Kansas River, it has not been

---

1/ The term minor effects, as used in the Regulatory Plan, is described as those effects which are not expected to have a significant impact on nondredging concerns such as adjacent landowners and various entities responsible for structures located in and along the river, nor would those effects be expected to unduly impact environmental resources.

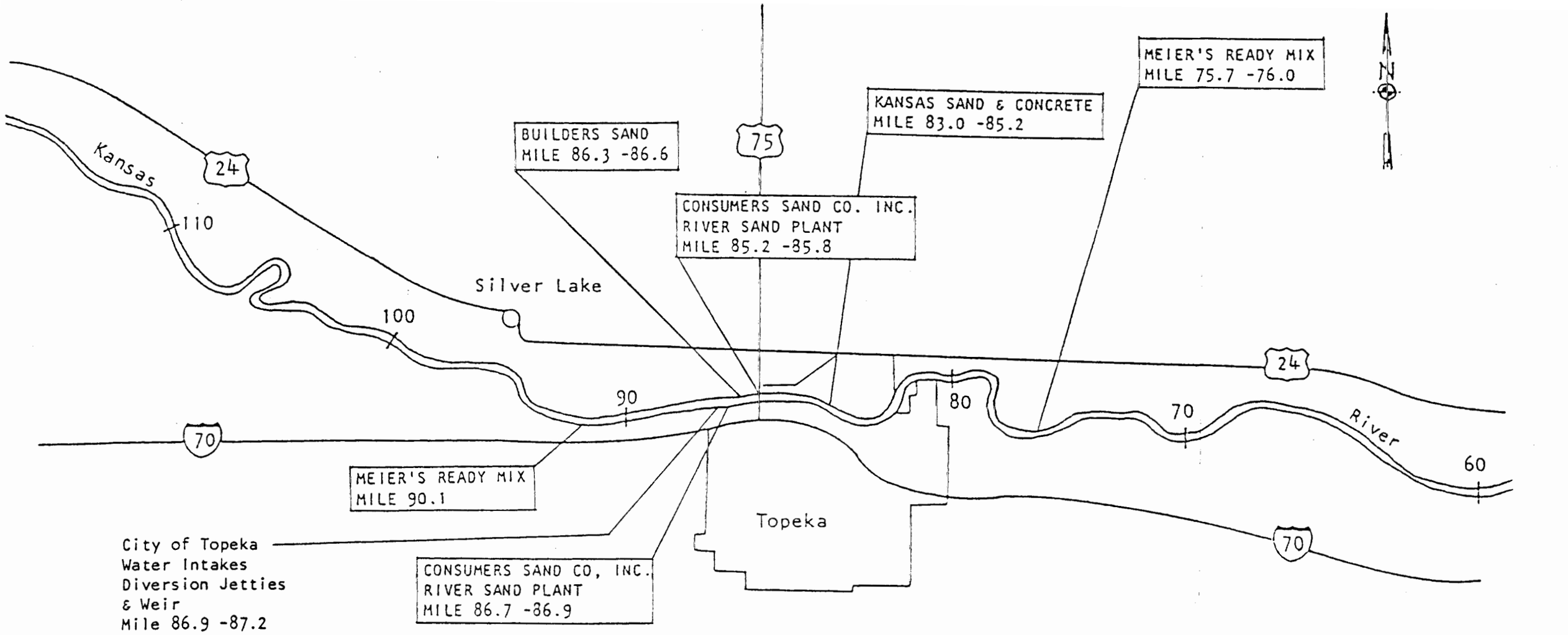
possible to develop a plan that will entirely satisfy the interests of all of the involved parties. The Plan satisfies the overall public interest involved and represents a compromise between the extremes of the alternatives available to the Kansas City District.



COMMERCIAL DREDGING

KANSAS RIVER

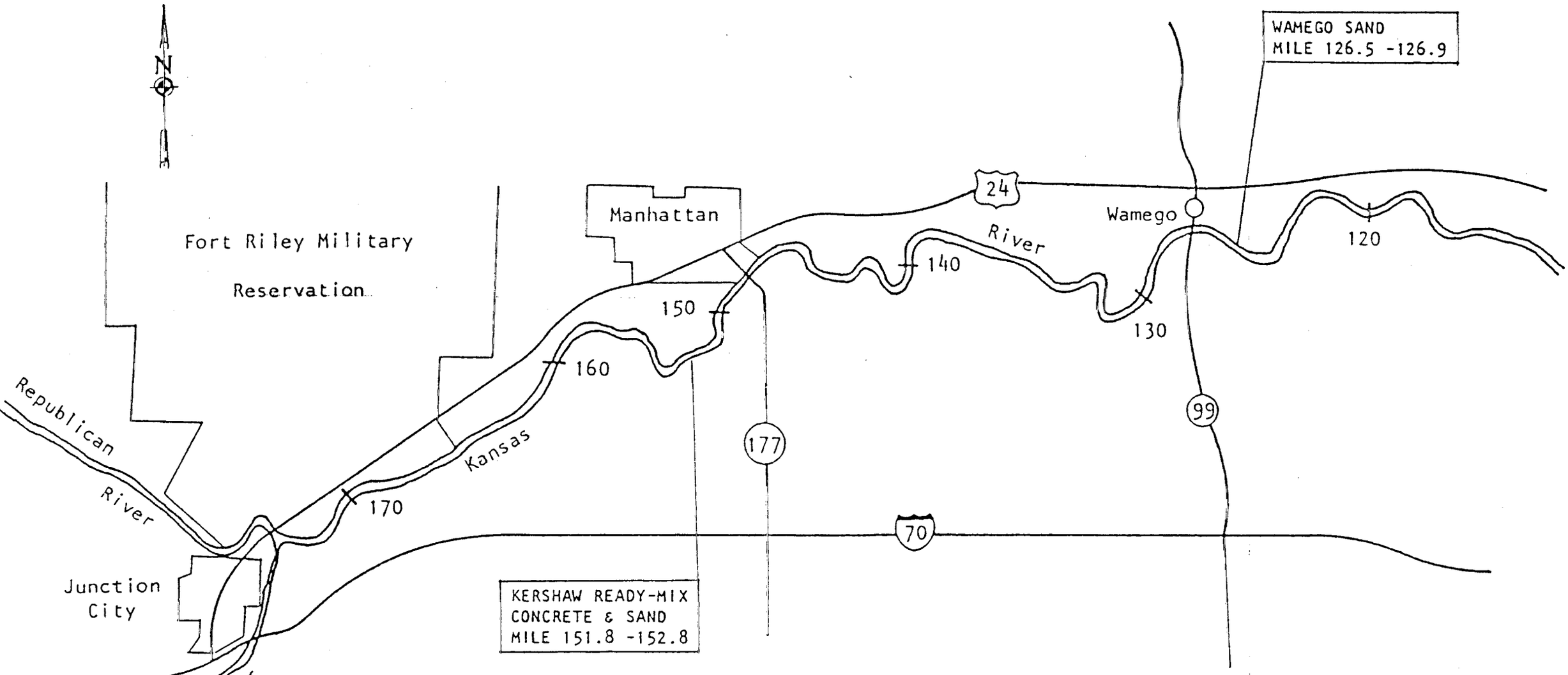
FIGURE 1



COMMERCIAL DREDGING

KANSAS RIVER

FIGURE 2



COMMERCIAL DREDGING

KANSAS RIVER

FIGURE 3

FINAL
ENVIRONMENTAL IMPACT STATEMENT
FOR
COMMERCIAL DREDGING ACTIVITIES ON THE KANSAS RIVER

FINAL

ENVIRONMENTAL IMPACT STATEMENT

Proposed Plan Governing the Issuance of Section 10 Permits for Commercial Dredging on the Kansas River

The responsible lead agency is the U.S. Army Engineer District, Kansas City. Cooperating agencies are the U.S. Fish and Wildlife Service and the U.S. Environmental Protection Agency.

Abstract: The Kansas River is an alluvial stream that flows in an easterly direction for 170 miles across the State of Kansas between Junction City and the Kansas-Missouri state line. It has been designated by Congress as a navigable water of the United States and as such is regulated under Section 10 of the Rivers and Harbors Act of 1899. In order to meet his responsibility under Section 10, the Kansas City District Engineer has considered public concerns related to the impact of commercial dredging on channel degradation, bank erosion, and channel widening and has decided to implement a formal plan (Regulatory Plan) for regulating this activity on the river. Of the alternatives considered, the "No Action" alternative would continue to permit dredging with the limited restrictions imposed in the past, the Cessation of Dredging would eliminate all dredging activity in the Kansas River, and the Restricted Dredging alternative would permit dredging but with a variety of new restrictions. The Restricted Dredging alternative has been selected as the approach to be used in the Regulatory Plan because it would limit the environmental and economic impacts associated with commercial dredging on the Kansas River and would not create an extreme economic hardship to the overall dredging industry or its customers.

THE OFFICIAL CLOSING DATE FOR RECEIPT OF COMMENTS IS 30 DAYS FROM THE DATE ON WHICH THE NOTICE OF AVAILABILITY OF THIS FINAL EIS APPEARS IN THE FEDERAL REGISTER.

If you would like further information on this statement, please contact:

Mr. Robert J. Smith
US Army Engineer District,
Kansas City
700 Federal Building
601 East 12th Street
Kansas City, MO 64106-2896
Telephone: (816) 426-2118

NOTE - Information, maps, displays, etc., that are discussed in the Kansas River Commercial Dredging Regulatory Report and appendixes are incorporated by reference in this EIS.

TABLE OF CONTENTS

	Title	Page
I.	SUMMARY	EIS-5
1.1.	Major Conclusions and Findings	EIS-5
1.2.	Areas of Controversy	EIS-6
1.3.	Unresolved Issues	EIS-6
1.4.	Relationship to Environmental Statutes and Other Environmental Requirements	EIS-6
II.	NEED FOR AND OBJECTIVES OF ACTION	EIS-9
2.1.	Study Authority	EIS-9
2.2.	Public Concerns	EIS-9
2.3.	Planning Objectives	EIS-9
III.	ALTERNATIVES	EIS-10
3.1.	Features Eliminated From Further Study	EIS-10
3.2.	Alternatives Considered in Detail	EIS-10
3.3.	Comparative Impacts of Alternatives	EIS-12
IV.	AFFECTED ENVIRONMENT	EIS-16
4.1.	Dredging Industry	EIS-16
4.2.	Sand and Gravel Market	EIS-22
4.3.	River Morphology	EIS-24
4.4.	River Structures	EIS-25
4.5.	Water Quality and Groundwater	EIS-29
4.6.	Floodway	EIS-30
4.7.	Land Use	EIS-30
4.8.	Recreation	EIS-31
4.9.	Aquatic Ecosystem	EIS-31
4.10.	Terrestrial Ecosystem	EIS-32
4.11.	Threatened and Endangered Species	EIS-33
4.12.	Cultural Resources	EIS-33

V. ENVIRONMENTAL EFFECTS EIS-35

5.1. Dredging Industry EIS-35
5.2. Sand and Gravel Market EIS-39
5.3. River Morphology EIS-42
5.4. River Structures EIS-45
5.5. Water Quality and Groundwater EIS-53
5.6. Floodway EIS-55
5.7. Land Use EIS-55
5.8. Recreation EIS-57
5.9. Aquatic Ecosystem EIS-57
5.10. Terrestrial Ecosystem EIS-60
5.11. Threatened and Endangered Species EIS-61
5.12. Cultural Resources EIS-61

VI. LIST OF PREPARERS EIS-63

VII. PUBLIC INVOLVEMENT EIS-64

7.1. Scoping Meeting EIS-64
7.2. Statement Recipients EIS-69
7.3. Public Views and Responses EIS-72

VIII. INDEX, REFERENCES, AND APPENDIXES EIS-73

LIST OF TABLES

NO.	TITLE	PAGE
EIS-1	Comparative Impacts of Alternatives	EIS-13
EIS-2	Kansas River and State Sand Production	EIS-20
EIS-3	Sand Prices Per Ton for Selected Cities (Concrete Sand)	EIS-22
EIS-4	Sand and Gravel Categorical Uses and Prices	EIS-22
EIS-5	Structures in the Channel of the Lower Kansas River and at Topeka (Excluding Bank Stabilization Structures)	EIS-26
EIS-6	Bank Stabilization Structures in the Channel of the Lower Kansas River and at Topeka	EIS-28
EIS-7	General Level of Water Quality Parameters of Importance in the Kansas River	EIS-29
EIS-8	Land Use Within One-half Mile of the Center of the Kansas River	EIS-30
EIS-9	Existing and Future Sand Prices (Averages) Kansas City Metropolitan Area	EIS-40
EIS-10	Sand and Gravel Dredging Rates	EIS-43
EIS-11	Results of Continuity Model, 1985 to 1995	EIS-44
EIS-12	Kansas River Pipeline and Cable Crossing	EIS-49
EIS-13	Well Field Mitigation Cost Estimates	EIS-51
EIS-14	Areas of Concern Expressed by the Public during the Scoping Process	EIS-67
EIS-15	Solutions to the Areas of Concern Identified by the Public during the Scoping Process	EIS-68

LIST OF FIGURES

EIS-1	Existing Dredging Operations on the Kansas River	EIS-17
EIS-2	Primary Market Area, Kansas River Dredging Operations	EIS-23

I. SUMMARY

1.1. Major Conclusions and Findings

The Kansas City District Engineer has determined that a Regulatory Plan will be used as a guide to issue or deny further permits for commercial sand and gravel dredging on the Kansas River. The proposed Regulatory Plan has been included as Appendix A to this report. The Regulatory Plan generally consists of limiting bed degradation (lowering of the river bed) within the Kansas River channel to an additional 2 feet, limiting the quantity of material that can be extracted from a given reach, limiting the quantity of material that can be extracted by a single dredge to 300,000 tons per year, maintaining and/or increasing minimum distance between the dredges and structures, and establishing a buffer distance of 2,000 feet between adjacent dredges. This plan would create a burden on some members of the dredging industry and some customers. However, other sources of sand and gravel do occur in this area and their use would result in relatively minor environmental and economic impacts. Of the other alternatives considered, "No Action" would result in further unacceptable economic impacts to non-dredging interests while Cessation of Dredging would result in extreme economic hardship to the dredgers on the Kansas River and their customers.

1.2. Areas of Controversy

Throughout the study efforts leading to the decision to formulate a Regulatory Plan, the commercial dredging interests expressed concern that they were being blamed for the degradation, bank erosion and channel widening which has occurred in the lower Kansas River to date. In defense of this position the dredgers contended that the construction of upstream tributary lakes by the Corps of Engineers has blocked the natural replenishment of sand and gravel into the downstream reaches, and that the operation of the reservoirs lends itself to increased bank erosion downstream.

The Kansas City District, Corps of Engineers (the District) position on this controversy is based on conclusions reached upon completion of approximately 12 years of study effort. While it was concluded from a 1984 Simons, Li, and Associates study (Simons, Li, and Associates, 1984) that the construction and operation of the upstream lakes has resulted in a reduction in the amount of bed material carried by the Kansas River system, it was also concluded that sand and gravel dredging appeared to be the primary cause of the bank erosion and channel widening in the lower 30 miles of the Kansas River. These conclusions are also supported by the results obtained from an earlier study conducted by the Corps of Engineers (Corps of Engineers, 1977). In this

1977 study, it was concluded that a preponderance of evidence existed which indicated that unrestricted removal of sand from the lower Kansas River had resulted in severe impacts on the river channel and adjacent lands.

After careful scrutiny of the data and conclusions generated by these and other studies, the District Engineer believes there is sound scientific support for attributing much of the past severe bed degradation, bank erosion, and channel widening on the lower Kansas River to commercial dredging. Furthermore, there is no reasonable opportunity for removing the Congressionally authorized and funded upstream Federal lakes which are already in place. The District Engineer is obligated to regulate dredging on the Kansas River in accordance with the intent of Section 10 of the Rivers and Harbors Act of 1899 and the National Environmental Policy Act (NEPA) of 1969.

1.3. Unresolved Issues

Being able to predict impacts resulting from implementation of the Regulatory Plan does involve various amounts of risk and uncertainty. Some of the anticipated impacts are easy to quantify relative to other impacts. Estimating the cost to repair a river structure based on a given level of river bed degradation involves less risk and uncertainty than predicting the impact on the construction industry that may result from limiting dredging on the Kansas River. Much of the risk and uncertainty involved in predicting impacts is dependent on the complexity of the issues involved and the amount of available information. Many of the impacts predicted for the dredging industry and sand and gravel market are especially difficult to address due to the inherent uncertainty of predicting business decisions in a complex market economy. However, the best that can be done is to outline the problems involved and present the most likely situations that may result.

1.4. Relationship to Applicable Environmental Statutes and Other Environmental Requirements

Archeological and Historic Preservation Act, as amended 16 U.S.C. 469, et. seq. and National Historic Preservation Act, as amended, 16 U.S.C. 470, et. seq. The Kansas State Historic Preservation Officer has been consulted with during preparation of this EIS. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

Clean Air Act, as amended, 42 U.S.C. 7069. All alternatives considered in this EIS are in compliance with the National Ambient Air Quality Standards. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

Clean Water Act, as amended, (Federal Water Pollution Control Act) 33 U.S.C. 1251, et. seq. The general impacts of the alternative plans with respect to existing state or Federal water quality standards have been assessed. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

Endangered Species Act, as amended, 16 U.S.C. 1531, et. seq. A listing of threatened and endangered species has been obtained for the study area. The general impacts of the alternative plans on these species have been determined. A Biological Assessment has been prepared and is found at Appendix D. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

National Environmental Policy Act, as amended, 42 U.S.C. 4321, et. seq. This EIS follows the procedural guidance for the Civil Works Program of the US Army Corps of Engineers--Engineer Regulation (ER) 200-2-2 and Appendix B - NEPA implementation Procedures for the Regulatory Program (33 CFR Part 325, Appendix B). These documents supplement the Council on Environmental Quality (CEQ) November 29, 1978 Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA).

Wild and Scenic Rivers Act, as amended, 16 U.S.C. 1271, et. seq. The National Park Service (formerly the Heritage Conservation and Recreation Service) has determined that particular segments of the Kansas River meet the criteria for Recreational River designation. The general impacts of the alternative plans to recreational opportunities have been determined. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et. seq. The U.S. Fish and Wildlife Service (USFWS) is a cooperating agency in the preparation of this EIS. As such, they have participated in the Scoping Process, preparation of the Biological Assessment for threatened or endangered species (Appendix D), and provided comments on the Draft EIS. Prior to the decision to prepare a Regulatory Report/EIS and its designation as a cooperating agency, the USFWS provided input on the issues identified in this EIS through participation in the Section 10 permit process.

Executive Order 11988, Flood Plain Management, 24 May 1977. The general impacts of the alternative plans on the floodplain have been determined. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

Executive Order 11990, Protection of Wetlands, 24 May 1977. The impacts of the alternative plans on wetlands have been determined in general. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

Council on Environmental Quality (CEQ) Memorandum, 11 August 1980, Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA. The impacts of the alternative plans on prime and unique agricultural lands have been generally determined. Site specific impacts will be identified through the Section 10 permit process if and when a permit is applied for at a specific location.

II. NEED FOR AND OBJECTIVES OF ACTION

2.1. Study Authority

The authority for the Corps of Engineers to regulate dredging on the Kansas River is contained in Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

2.2. Public Concerns

The study effort leading to the preparation of a Regulatory Plan was a result of public concerns over the effect of continued commercial dredging on riverbed degradation (hereafter referred to as degradation), bank erosion, channel widening, the river's fishery, and on the integrity of structures located in or adjacent to the Kansas River channel. The dredgers are concerned about proposed regulatory restrictions and how those restrictions may affect their companies and customers. It should be noted that there have been several changes made to the specific features contained in the final Regulatory Plan. These changes have been made in response to comments received during the public review of the draft Regulatory Report and EIS. Consideration was given to these changes in the preparation of this final EIS.

2.3. Planning Objectives

The following planning objectives were developed to reflect the expressed public concerns and the identified resource management needs. These objectives were considered during formulation of the Regulatory Plan.

* To reduce or eliminate bed degradation, bank erosion, and channel widening associated with commercial dredging.

* To prevent or minimize damage to public and/or private works located in and immediately adjacent to the river.

* To preserve/conserve the resources of the study area, including aesthetic, cultural, and ecological.

III. ALTERNATIVES

3.1. Features Eliminated From Further Study

During the early stages of the preparation of the Regulatory Plan, various alternatives with separate features were considered for inclusion in the plan. A description of those features which were eliminated from consideration and the reason for their elimination are discussed in this section.

Restricted Dredging -- Restrict Dredging During Fish Spawning. This feature would prohibit dredging during the period between April 15 and June 15 each year in order to increase the chance for successful fish reproduction. The Fishery-Dredging Study (Cross et. al., 1982), which addressed the impact of commercial dredging on the fishery of the lower Kansas River identified the actual change in physical habitat as the major impact to the fishery associated with dredging. This study found no evidence that dredging operations prevented adequate recruitment to fish populations. Therefore, since this feature would do little to improve the habitat and correspondingly the fishery, it was eliminated from further investigation.

3.2. Alternatives Considered in Detail.

Three general alternatives were considered in detail; "No Action," Cessation of Dredging (elimination of dredging), and Restricted Dredging. A description of the major features contained in each alternative and the general reasons for their consideration are presented in the following section. The proposed Regulatory Plan, incorporating the Restricted Dredging alternative, does include specific features restricting commercial dredging on the Kansas River along with a Monitoring Program and is contained in Appendix A of this document. The Restricted Dredging alternative is the selected alternative.

No Action. Under "No Action", the Corps would continue to issue permits containing the limited restrictions imposed in the past. These restrictions would include keeping dredging operations a minimum distance from any island, bankline, bridge pier, bank stabilization structure, or water intake. "No Action" would also open new (previously undredged) reaches of the Kansas River to dredging. In view of the degradation, channel widening, and bank erosion which has occurred with the existing program of dredging, more controls are needed. In contrast, the "No Action" alternative allows continuation of an undesirable condition which is contrary to the intent of the study effort to reduce or eliminate adverse impacts associated with commercial dredging. The "No Action" alternative is retained, however, in order to

provide a "without condition" for comparison with the other alternatives, and to comply with Section 1502.14(d) of the CEQ "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act."

Cessation of All Dredging. This alternative would prohibit commercial dredging along the entire length of the Kansas River. Existing dredging operations would stop and no new dredging would be permitted. The demand for the required materials would have to be met by alternate sources, or substitute materials.

Studies conducted by or for the Corps of Engineers over the last eight years indicate that some limited degradation can occur throughout much of the Kansas River without significant, adverse environmental and economic impacts. Therefore, except in local areas, there was no reason to consider a total cessation of dredging. However, this feature was retained for further consideration in order to comply with Section 1502.14(a) of the CEQ Regulations which require all reasonable alternatives be evaluated.

Restricted Dredging (The Selected Alternative). This alternative contains three general features: (1) Restrict the level of allowable bed degradation; (2) Establish minimum allowable distances from structures, banklines, etc.; and (3) Restrict the quantity of material to be extracted. The specific features contained in this alternative are incorporated into the Regulatory Plan contained in Appendix A.

Whether or not dredging would be allowed to continue in a certain reach of the Kansas River would be determined under this alternative, by the extent of degradation observed. Two feet has been established as the maximum, acceptable level of bed degradation. The amount of degradation would in turn be measured by a Monitoring Program (See Appendix A). Since this restriction directly addresses a point of public concern, and is implementable, it was retained for further consideration.

This alternative would also retain and/or modify the existing minimum distance restrictions between dredges and the riverbank along with any structures located in or adjacent to the river channel. New restrictions would also establish minimum distances between adjacent dredging operations. Since some aspects of this measure have been used successfully in the past to prevent and/or reduce degradation on a local basis, it was retained for further analysis, recognizing that its effects would extend only to local situations.

In addition, this alternative would limit the amount of material which could be removed from the Kansas River. This limit would apply to both individual dredgers and to specific reaches of the river. The production of the dredgers would be monitored. The exact relationship between the amount of material

dredged and the amount of degradation that results is not known precisely. Results from a Monitoring Program would be needed to better define this relationship. This feature was retained for further consideration because the quantity of sand and gravel extracted from the river is an important factor affecting the river's channel stability. Limiting the quantity of material extracted would provide some control over the magnitude of localized impacts, in the vicinity of a dredge, and also overall impacts within a given reach of the river.

3.3. Comparative Impacts of Alternatives

A comparison of the probable impacts that would result with each alternative is given in Table EIS-1.

TABLE EIS-1
COMPARATIVE IMPACTS OF ALTERNATIVES

Resource	No Action Alternative	Cessation of Dredging Alternative	Restricted Dredging Alternative*
Dredging Industry	Existing dredging operations would gradually move upstream to new locations of sand at their discretion.	Forces dredging industry to land mining within floodplain or to Missouri River for aggregate.	Some dredging operations would move upstream, while others may move to land mining or Missouri River dredging.
Sand and Gravel Market	Increase in cost of aggregate as distance between source and consumer increases.	Increase in cost of aggregate as new sources are utilized.	Increase in cost of aggregate as distance between source and consumer increases and new sources are utilized.
River Morphology	Additional extreme degradation in lower river; in upper river, areas of aggradation, no change, and up to 2 feet of additional degradation.	No change in extent of degradation in extreme lower river; some areas of aggradation, degradation, and no change in rest of the river.	Additional degradation up to an average of 2 feet in the Topeka area and lower river; little change in rest of river.
River Structures	Significant damage to existing bridges, pipelines, bank stabilization and water intake structures.	Minimal damage to structures.	Minimal damage to structures.
Water Quality/ Groundwater	No significant change in water quality; lower groundwater levels in areas of bed degradation.	Minimal benefit to water quality; little or no change in groundwater levels.	No significant change in water quality; minimal lowering of groundwater levels in areas of bed degradation.

TABLE EIS-1 (cont.)
COMPARATIVE IMPACTS OF ALTERNATIVES

Resource	No Action Alternative	Cessation of Dredging Alternative	Restricted Dredging Alternative*
Floodway	No impact to floodway in upper or extreme lower reach of river; areal extent of floodway and flood frequency may decrease in De Soto area.	No change throughout river.	No impact to floodway in upper or extreme lower river; some minor decrease in floodway and flood frequency possible in De Soto area.
Land Use	Conversion of up to 10 acres of land, per dredging operations, for support area as dredgers move upstream.	Depends on alternative source of aggregate developed by dredging industry. Land mining and Missouri River would consume 62 and 15 acres of floodplain per operation, respectively.	Conversion of 10, 62, and 15 acres of land, per operation, for moving upstream, land mining, and Missouri River, respectively.
Recreation	No change in recreational opportunities in upper or extreme lower reach of river; some increased opportunity for recreational boating in De Soto area.	No impact.	No change in recreational opportunities in upper or extreme lower river; some increased opportunity for boating in the De Soto area.
Aquatic Ecosystem	Decline in habitat quality in extreme lower river; Improvement followed by decline in habitat quality in De Soto area; no change to habitat quality in upper river.	Initially, some decline in habitat quality and species diversity at existing dredging sites. With time, river would revert back to its natural state.	Some decline in habitat quality in extreme lower river; improvement followed by some limited decline in De Soto area; no change in upper river.

TABLE EIS-1 (cont.)
COMPARATIVE IMPACTS OF ALTERNATIVES

Resource	No Action Alternative	Cessation of Dredging Alternative	Restricted Dredging Alternative*
Terrestrial Ecosystem	Decline in quantity of habitat throughout lower river reach. No effect on upper river.	Depends on alternative source of aggregate developed by dredging industry. Land mining and Missouri River dredging would impact 62 and 15 acres, per operation, of terrestrial habitat. No effect on upper river.	Conversion of 10, 62, and 15 acres of existing habitat, per operation, for moving upstream, land mining, and Missouri River, respectively. No effect on upper river.
Endangered Species	No obvious impact; would be assessed for each permit application.	No obvious impact.	No obvious impact; would be assessed for each permit application.
Cultural Resources	Requirement for new dredge support areas may expose unknown cultural resources; would be assessed for each permit application.	Depends on alternate source of aggregate developed by dredging industry. Land mining could expose unknown cultural resources.	Requirement for new dredge support areas may expose unknown cultural resources; would be assessed for each permit application.

*Selected Alternative

IV. AFFECTED ENVIRONMENT

4.1. Dredging Industry

There are presently 22 permitted dredging operations from 10 different companies located on the Kansas River (Figure EIS-1). However, not all operations are active at the same time and the actual number of dredges working on the river at any given time varies with an average of about 15. The most downstream operation is authorized between river mile 6.0 and 7.0 near Kansas City, Kansas, and the most upstream, between river miles 151.8 and 152.8, near Manhattan, Kansas. The reach below Bonner Springs has been the most heavily dredged and contains 10 of the 22 operations, with 8 of those concentrated in a 12-mile segment between Bonner Springs and the Turner Bridge. Of the 12 remaining operations, 3 are located between De Soto and Bonner Springs, one is just downstream from Bowersock Dam at Lawrence, 6 are located in Topeka, and 2 are located in the upper river; one just downstream of Wamego, and the other just upstream of Manhattan.

Sand production from the Kansas River in 1987 was 4.06 million tons, according to the Kansas Department of Revenue (John Parks, 1988. Personal communication), with 3.21 million tons removed from the lower Kansas River below Bowersock Dam. Since 1984, the lower Kansas River has provided on the average 81.5 percent of the total production of sand from the Kansas River. With an estimated inflow of sand into the lower Kansas River of 1.7 million tons annually (Simons, Li, and Associates, 1984), dredging in the lower Kansas River has been removing a larger quantity of sand than is replenished by the river on an annual basis. Sand production from the Kansas River has fluctuated between 2 and 4 million tons since 1964. (Table EIS-2) and the Kansas River has averaged 96.2 percent of the statewide production since 1964.

Two general categories of dredgers exist on the Kansas River; small, upstream companies located west of De Soto, Kansas and large, downstream companies located east of De Soto, Kansas. The downstream firms supply the large Kansas City market. The average annual revenue in 1979, was $227,000 for upstream dredgers and $2,076,000 for downstream firms (Burns & McDonnell, 1982).

The exact amount of taxes paid by Kansas River dredging companies is unknown. These companies are subject to a State corporate income tax of 4-1/2 percent on the first $25,000 of income with a 2-1/4 percent surtax imposed on earnings above that figure. It was estimated that in 1979 average state income tax liability was $2,500 for small firms and $20,000 for the larger firms (Burns & McDonnell, 1982). In addition commercial dredgers must pay a state excise tax of $0.02 per ton sold. This tax produced about $81,000 in revenue from the Kansas River in 1987.

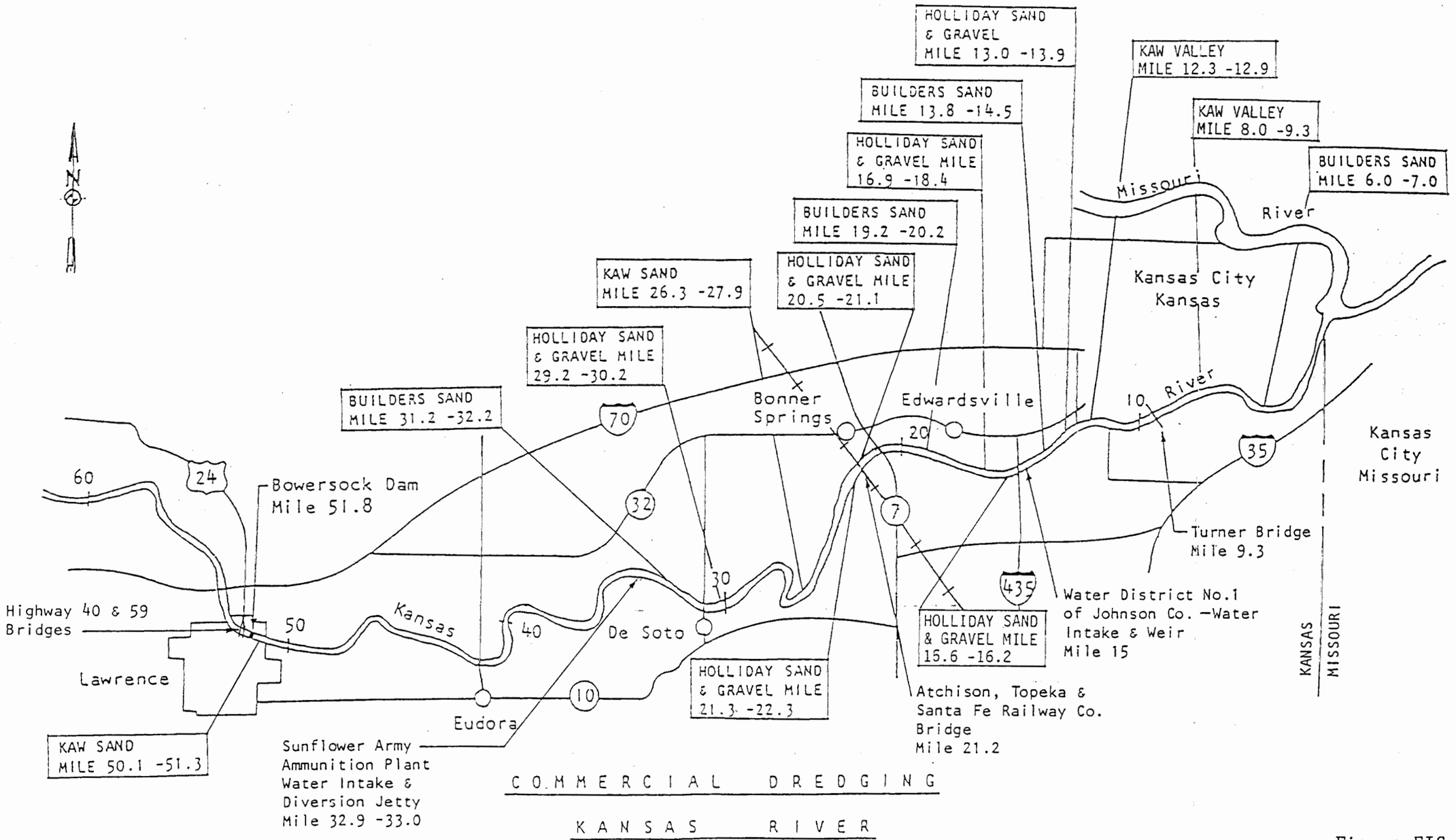
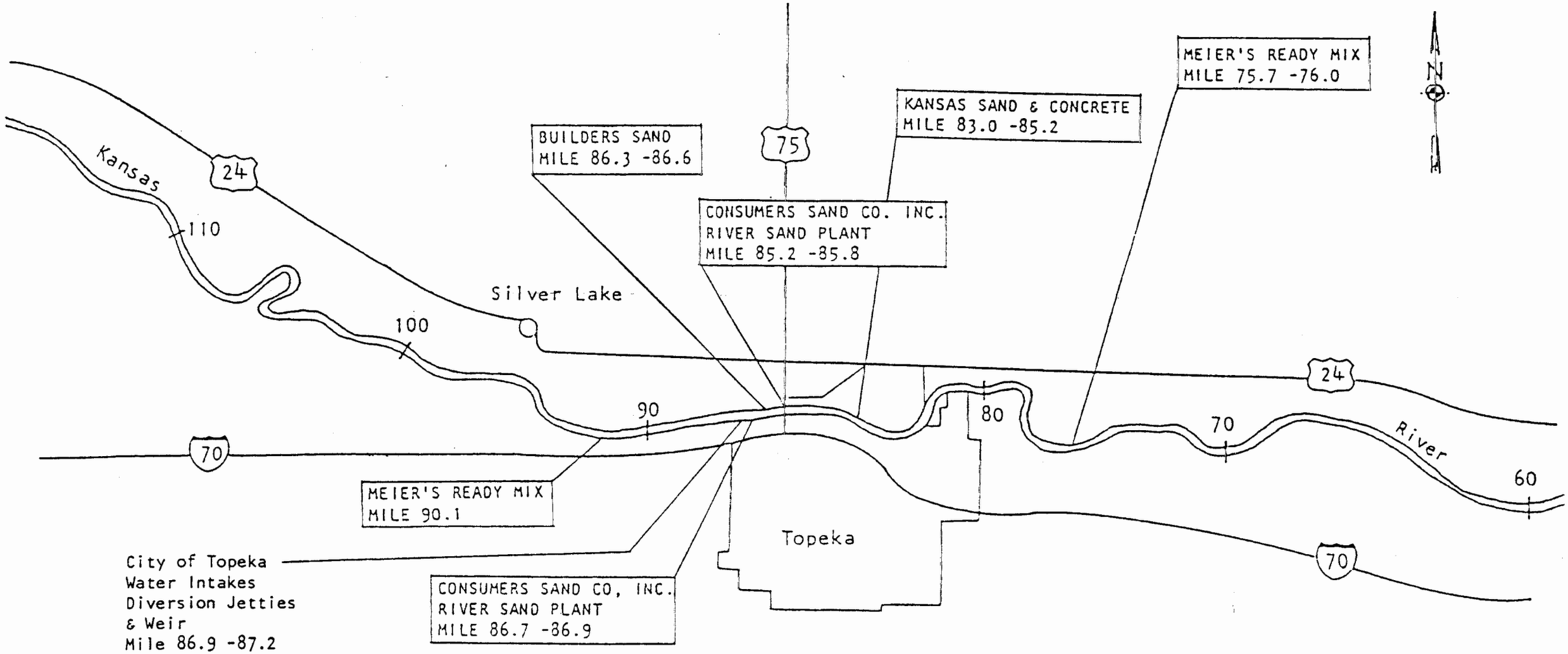


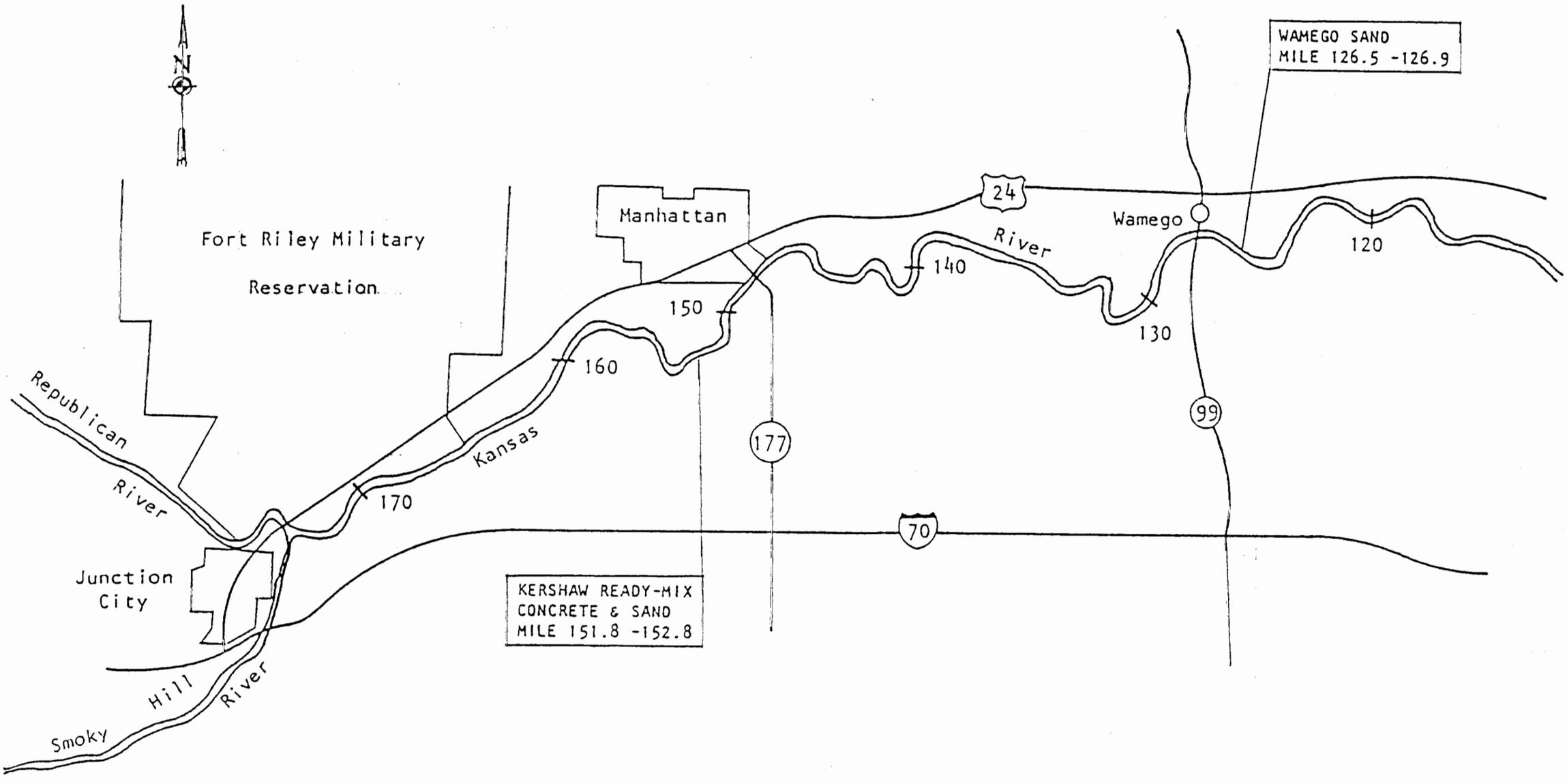
Figure EIS - 1
Existing Dredging Operations on the Kansas River



C O M M E R C I A L D R E D G I N G

K A N S A S R I V E R

Figure EIS - 1 (cont.)
Existing Dredging
Operations on the
Kansas River



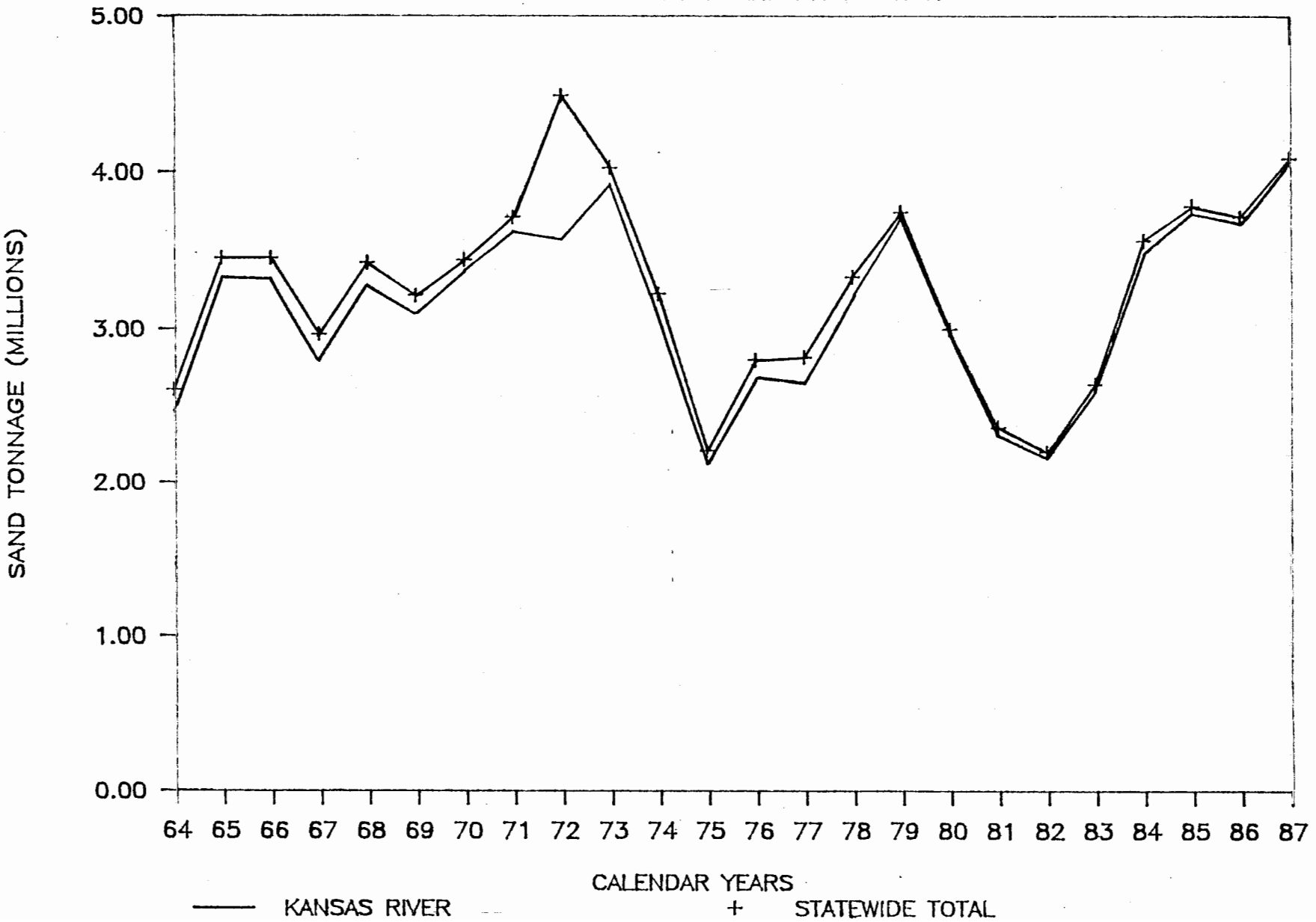
COMMERCIAL DREDGING

KANSAS RIVER

Figure EIS - 1 (cont.)
Existing Dredging
Operations on the
Kansas River

TABLE EIS–2

KANSAS RIVER & STATE SAND PRODUCTION



These taxes represent a relatively minor source of revenue for the State of Kansas. Dredging operators are also subject to property taxes in their respective counties. The amount paid is dependent on each county's rate and the assessed value of the property.

Each individual dredge operation consists of a dredge, on-shore processing equipment and sales office/scale. The dredges are floating hydraulic suction-type units. Each unit has either a chain-and-ladder device or rotating head to loosen the sand and gravel bed before it enters the suction tube. A pipeline mounted on pontoons conveys the dredged material to the on-shore processing area where it is cleaned, sorted by size, and stored in piles pending distribution to consumers. This equipment arrangement represents the "typical" operation as defined by Booker Associates (1986). This "typical" operation will be referenced to throughout the remainder of this EIS, for ease of evaluation, even though there is a range in sizes of dredge operations on the Kansas River. Costs quoted in the Booker Associates report (1986) have been updated to 1988 prices for use in this EIS.

The average value of a "typical" dredging operation was $1.255 million in 1985. The average number of employees associated with this operation was 12 and, at an average cost of $33,000 per employee, the labor cost was $396,000 annually in 1985.

The "typical" operation annually produces 300,000 tons of various types of sand and gravel at an average cost of $2.48 per ton and markets it at an average sale price of $2.75 per ton, for a 9.8 percent profit margin. Based on an average trip length of 20 miles and a transportation cost of $0.125 per ton mile, the delivered price per ton is estimated to be $2.50 per ton more than the price at the plant for a total delivered price of $5.25.

Although other potential sources of sand exist in the same region, Kansas River sand is considered in general to be more desirable. This is due to its quantity of coarse sand, which is desired for ready-mix concrete and asphalt, and the absence of lignite, which is considered a deleterious material in concrete production. In addition, Kansas River resources have been developed to such an extent as to realize important savings in production costs relative to other material sources. Consequently the Kansas River is the most desired and least costly source of sand and gravel available in the region. However, there are high volume producers on the Missouri River who are able to sell their products at competitive prices. As illustrated in Table EIS-3, the overall price of sand is relatively low in the Kansas City area when compared to other regions of the country.

TABLE EIS-3
SAND PRICES PER TON
FROM SELECTED CITIES
(Concrete Sand)

Atlanta	$12.00	Detroit	$ 4.00
Baltimore	8.25	Kansas City*	3.00
Boston	9.00	Los Angeles	8.33
Chicago	6.20	Minneapolis	5.80
Cincinnati	5.10	San Francisco	8.70
Denver	5.10	St. Louis	8.50

Source: Engineering News Record (ENR), September 1, 1988

*Kansas River dredging company representatives indicated an average price of approximately $2.64 per ton for concrete sand. ENR reporting reflects prices from a single source for each city.

4.2. Sand and Gravel Market

The principle market for sand and gravel produced by the dredging operations which are presently located downstream of Bonner Springs near River Mile 22 (R.M. 22) is the Kansas City metropolitan area (Figure EIS-2). The Lawrence, Topeka, Wamego, and Manhattan operations in turn serve the Lawrence, Topeka, Manhattan, and Manhattan-Junction City areas respectively. The average haul distance for the sand and gravel produced is 20 miles. (Booker Associates, 1986).

Sand and gravel produced from the Kansas River have several categorical uses as presented in Table EIS-4. The averages presented are estimates for a "typical" Kansas River dredging operation.

TABLE EIS-4
SAND AND GRAVEL
CATEGORICAL USES AND PRICES

	% Of Output		Price (@ Plant)	
	Range	Avg.	Range	Avg.
Ready-Mix Concrete Sand and Dry Sand	40-70%	65%	$2.50 - 2.80	$2.64
Asphalt Sand	10-30%	20%	2.30 - 2.80	2.55
Masonry Sand (for mortar)	5-15%	10%	2.95 - 3.15	3.03
Fill Material & Misc.	1-10%	3%	1.90 - 2.25	2.07
Rock and Gravel	1- 8%	2%	6.00 -10.50(+)	8.06
Weighted average				$2.75

Source: Updated from Booker Associates, 1986

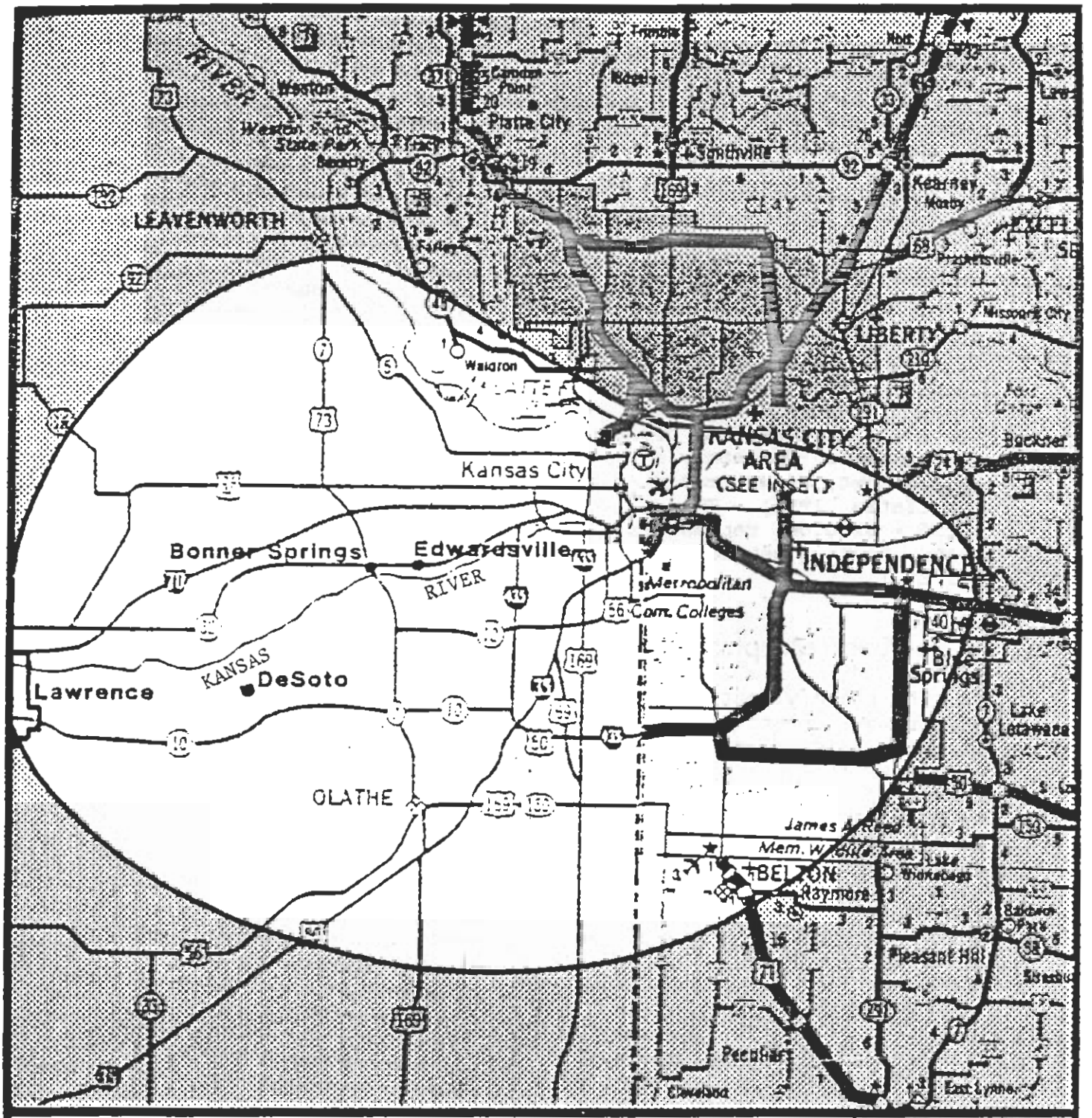


FIGURE EIS-2

Primary Market Area

Kansas River Dredging Operations

The term "dry sand" refers to a particular category of sand with a high silica content that is dried and used primarily in the manufacturing of fiberglass. The only two producers of dry sand in this region are two dredge operations on the Kansas River (Booker Associates, 1986).

The building and road construction industry is by far the main consumer of Kansas River sand and gravel, representing approximately 90 percent of the total estimated demand. Approximately 7-10 percent of the cost to produce concrete can be attributed to the cost of purchasing sand. For asphalt, aggregate requirements appear to cause about 5 percent of production costs (Burns & McDonnell, 1982). It is likely that the proportional outlays for aggregates by these producers tend to remain relatively stable. Asphalt producers, who must use considerable amounts of oil, do experience some variability as the price of petroleum products vary. In the construction of an average size, one-story single family home, containing 1,600 square feet, an estimated 40 tons of sand is required (Booker Associates, 1986). The delivered price of this sand (40 tons x $5.25 = $210.00) represents 0.3 percent of the total construction costs which is estimated at $64,000 ($40 per sq. ft. x 1,600 sq. ft.).

4.3. River Morphology

The primary feature of the Kansas River between its mouth and a rock weir constructed by Water District No. 1 of Johnson County at R.M. 15 is the presence of backwater from the Missouri River. Backwater is the pooling that occurs in the Kansas River as a result of higher stages in the Missouri River. Because of the effects of the backwater, the flows in this reach tend to be placid and deep. Another feature in this reach is a natural rock deposit located between R.M. 12.2 and 12.4. This rock deposit is significant since it serves as a control against riverbed degradation. Similarly, for the area immediately upstream of the Water District No. 1 weir, the weir serves as a control against riverbed degradation. At low flows, the weir also creates backwater for some distance upstream, resulting in deposition of fine sediment.

Between the Water District No. 1 weir and Bowersock Dam (R.M. 51.8) is another natural rock deposit at R.M. 21.8-22.8. This mile-long rock deposit is also an important riverbed control. The heavily dredged reach of river downstream of the rock deposit has significantly lower riverbed elevations than the undredged reach upstream of the deposit. Immediately downstream of Bowersock Dam, degradation of the channel bed is also occurring. Bowersock Dam provides a control against riverbed degradation upstream and at all flows, creates a backwater effect upstream. The reach of river between the rock deposit and Bowersock Dam has

numerous areas of bank instability. At a few of these locations, the bank instability is severe enough that bank protection measures have been constructed. These generally include revetments, riprap slope protection, and hard points.

The river between Bowersock Dam and the headwaters of the Kansas River is relatively stable. However, significant bank instability or evidence of bed degradation has occurred in four areas; 1) Topeka (R.M.±85), 2) the confluence of the Blue River (R.M. 147.7), 3) the confluence of the Republican River (R.M. 172.0) and 4) between R.M. 109 and 115. At Topeka, a considerable amount of sand and gravel mining has taken place. Extensive Federal flood protection works have narrowed the channel and stabilized the banks. In this area, 1-2 feet of channel degradation has occurred. At the confluences of both the Blue River and the Republican River, less than two feet of degradation has occurred as a result of the operation of the respective Tuttle Creek and Milford Lake Dams. Between R.M. 109 and 115, bank erosion rather than degradation has actively occurred.

4.4. River Structures

There are 27 bridges, 24 pipeline crossings, 3 water intakes, 3 weirs, one telephone cable crossing, and 34 areas of bank stabilization located in, under, or adjacent to the lower Kansas River between its mouth and Bowersock Dam (Lawrence) and in the Topeka area. They are listed by river mile in Tables EIS-5 and EIS-6. These structures are receiving special consideration over those in the remainder of the river because they are in areas where substantial riverbed degradation has already occurred, or where it is expected to occur in the future without further regulation of commercial dredging.

TABLE EIS-5

Structures in the Channel of the Lower Kansas River and at Topeka (Excluding Bank Stabilization Structures)

River Mile	Year Built (*Date of Blueprint)	Description
0.2	-	RR Bridge
0.2	-	Lewis & Clark Viaduct Bridge
0.3	-	James St. Bridge
0.35	1965	36" Sewage Forcemain
0.7	-	RR Bridge
1.2	-	Central Ave. Bridge
1.5	-	RR Bridge
1.7	-	Stockyard Bridge
2.0	-	E. Kansas Ave. Bridge
2.5	-	RR Bridge
3.1	1975	30" Sewer Main
3.5	-	7th St. Bridge
4.4	-	12th St. Bridge
4.4	1940	24" Water Main
4.65	1966	30" Sewer Line
4.9	1957*	18th St. Bridge
5.3	1975	24" Sewer Line
5.8	1986	Kansas Ave. Bridge
7.2	1986	I-635 Bridge
9.0	1943	8" Pipeline
9.3	1955*	Turner Bridge
11.5	1963	10" Pipeline
11.6	1978	3-8", 2-12" Petroleum Pipelines
11.6	1930	8" Petroleum Pipelines
11.6	1930	6" Petroleum Pipelines
14.65	1954	2-20" Gas Lines
15.0	1964 and 1985	Johnson County Water District No. 1 Intake and Weir
15.5	1976*	I-435 Bridge
16.5	1967	2-8" + 10" Pipelines
16.6	1980	12" Forcemain
20.3	1982*	Bonner Springs Hwy 7 Bridge & Pipeline
21.2	1938*	Atchison, Topeka, & Santa Fe RR Bridge
31.0	1969*	De Soto Bridge
31.2	1957	Telephone Cable
32.3	1966	16" Water Line
32.9	1944	Sunflower Plant Water Intake Structure
42.5	1963*	Eudora Bridge
49.6	1969	8" Fertilizer Line
49.75	1963	26" Gas Line
49.75	-	6-10" Pipelines
50.9	1976	18" Sewer Forcemain
50.9	1956	8" Sewer Forcemain
51.8	1872	Bowersock Dam
51.8	-	Lawrence Bridge

TABLE EIS-5 (cont.)

Structures in the Channel of the Lower Kansas River and at Topeka (Excluding Bank Stabilization Structures)

River Mile	Year Built (*Date of Blueprint)	Description
79.6	1960	6" Petroleum Pipeline
79.8	1960	8" Petroleum Pipeline
82.8	1963	18" Sewage Forcemain
83.0	-	Sardou Ave. Bridge
83.7	1938*	Atchison, Topeka & Santa Fe RR Bridge
84.2	-	Kansas Ave. Bridge
84.4	1937*	Topeka Avenue Bridge
84.5	1939*	Southern Pacific RR Bridge
86.2	-	Sewer Main
87.0	1986	Topeka Intake, Weir, and Jetties
87.7	1951*	Westgate Bridge

Source: Simons, Li, and Associates, 1985

TABLE EIS-6
Bank Stabilization Structures in the Channel
of the Lower Kansas River and at Topeka

River Mile	Bank	Length ft.	Stabilization Type	Sponsor/ Owner	Year Installed
8.2	L	1,500	Riprap	Un. Pac. RR	Pre-1960
12.0	L	3,000	Riprap	Un. Pac. RR	Pre-1958
15.5	R	4,000	Riprap	Santa Fe RR	Pre-1954
17.0	L	5,000	Hardpoints	Local	-
18.8	L	1,000	Hardpoints	Local	-
18.8	L	5,500	Hardpoints	Local	-
19.0	L	5,500	Riprap	Un. Pac. RR	Pre-1954
21.5	R	2,000	Riprap	Local	Pre-1954
23.4	R	2,500	Bus Bodies/ Dikes	Local	-
23.8	R	1,000	Kellner Jacks	Santa Fe RR	-
25.5	R	2,500	Riprap	Santa Fe RR	Pre-1954
27.5	L	6,000	Hardpoints	Local	Pre-1954
29.0	R	5,000	Riprap	Local	1960
30.0	R	2,500	Kellner Jacks- Riprap	Santa Fe RR	1954 to 1958
30.5	R	2,500	Riprap	Santa Fe RR	Pre-1954
31.4	R	300	Tires	Local	1979
31.5	L	1,000	Dikes	Corps Sec 14	1969
32.4	R	2,000	Dikes	Local	Pre-1954
34.2	L	3,000	Riprap	Un. Pac. RR	Pre-1954
39.0	L	1,500	Riprap	Un. Pac. RR	Pre-1954
39.8	L	2,000	Riprap	Un. Pac. RR	Pre-1954
40.2	R	3,000	Riprap	Local	Pre-1958
42.8	R	2,500	Dikes	St. Hwy Dept	1953 to 1954
43.1	L	1,500	Dikes	Corps Sec 14	1954 to 1960
43.7	L	2,500	Windrow Revet/ Toe Protection	Corps Sec 32	1979
44.1	L	2,000	Dikes	Un. Pac. RR	Pre-1958
46.7	L	2,500	Riprap	Un. Pac. RR	Pre-1954
48.0	R	2,000	Windrow Revet/ Debris	Local	-
50.4	L	2,000	Riprap	Local	1956
84.0	R	5,500	Riprap	Corps & others	1960 & earlier
85-87	L	15,000	Riprap/ Hardpoints	Local	Many dates
87.0	R	1,000	Riprap	City of Topeka	-
87.0	L	5,000	Dikes	Local	-
87.7	R	1,500	Riprap	Local	Pre-1960

Source: Corps of Engineers, 1980

4.5. Water Quality and Groundwater

The water quality parameters of importance to the Kansas River are bacteria, dissolved oxygen, metals, minerals, nutrients, organics, pesticides and turbidity. Any discussion of the general levels of these parameters in the river, however, must recognize their relationship to the watershed, and flow. Agricultural run-off from within the watershed has by far the largest adverse impact on water quality in rural areas. Conversely, in urban areas, urban run-off and industrial-municipal point source discharges have their greatest influence on water quality. With respect to flow, several of the parameters show elevated levels during periods of run-off, whereas others are dominant during periods of low flow.

The general level of each parameter in the river is summarized in Table EIS-7. The terms high, moderate and low are relative terms, and relate to existing state or Federal water quality standards. Specific water quality data are presented in Cross et. al. (1982) and Burns & McDonnell (1982).

TABLE EIS-7
General Level of Water Quality Parameters of Importance in the Kansas River

Water Quality Parameter	General Level
Bacteria	High
Dissolved oxygen	High
Metals	Low
Minerals	Moderate
Nutrients	High
Organics	Low
Pesticides	Low
Turbidity	High

Groundwater levels along the Kansas River are dependent on the river stages. In addition, recharge from local precipitation and pumping from wells also have a significant influence on the groundwater system. In general, the water table is above the river water surface and contributes to river flow. However, when well pumpage lowers the groundwater level, the river contributes water to the groundwater system. In recent years, river channel degradation (and associated lowering of river water levels) has caused concern for the impact of declining groundwater levels on nearby groundwater supplies used by municipalities, industries, and irrigators.

4.6. Floodway

The floodway of a stream is defined in the National Flood Insurance Act of 1968 (NFIA) as the channel of the stream plus any adjacent floodplain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Correspondingly, minimum standards of the NFIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. Such a floodway has been determined for the Kansas River. The excavation of dredge pits in the Kansas River has increased the potential volume of the river channel and has most likely reduced the area of the floodway, to some extent, along with flood frequency. This reduction in floodway and flood frequency would represent a reduction in flood hazard.

4.7. Land Use

Land use in 1978, for the area approximately one-half mile on either side of the center of the Kansas River, was determined (Land Inventory and Development, Inc., 1979) and is presented by river reach in Table EIS-8. Cropland is followed by deciduous forest as the most common land uses in all reaches except the mouth to DeSoto reach where, as might be expected, industrial use follows cropland.

Table EIS-8
Land Use Within One-Half Mile of the Center of the Kansas River

Land Use	Percentage of Total Acreage		
	Mouth to De Soto	De Soto to Lawrence	Lawrence to Jct City
Agricultural cropland	34.1	54.6	53.8
farmstead	0.2	0.4	0.4
pasture	0.5	0.7	0.0
Erosion and deposition areas	2.4	0.3	0.6
Extractive	1.8	0.0	0.2
Forest-deciduous	13.1	15.3	18.8
Non-agricultural/Open Field	6.1	2.9	4.1
Utilities-transportation	2.1	0.0	0.1
Urban-commercial/public	2.0	1.0	2.5
Urban-industrial	13.9	2.6	1.3
Urban parks, cemeteries, and open	1.0	0.4	0.1
Urban-residential	8.5	3.3	2.7
Water-lake	0.2	0.0	0.0
Water-pond	0.0	0.3	0.3
Water-stream	14.1	18.2	15.2

Source: Land Inventory and Development, Inc., 1979

4.8. Recreation

Recreational use of the Kansas River consists mainly of fishing and canoeing. Fishing is probably the most common use, and was estimated at 29,909 person days/year in 1977 (Kansas Fish and Game Commission, 1977). In urban areas, hiking, jogging, and non-consumptive wildlife use also occurs. There is some additional non-consumptive use associated with bald eagle overwintering areas along the river. There are presently five boat launching ramps distributed along the river, with one ramp located on the Wakarusa River approximately one mile upstream of its confluence with the Kansas River.

The Heritage Conservation and Recreation Service (now the National Park Service) conducted a potential recreation site investigation in 1980 along the Kansas River (Corps of Engineers, 1980). This study determined that the greatest potential for recreation is found on the lower Kansas River downstream of Lawrence and that this segment does meet the criteria for Recreational River designation under the Wild and Scenic Rivers Act. This study found that downstream of Lawrence, recreational use decreases due to the lack of facility development and access points along the river. However, use does increase somewhat on the river segment near Kansas City. Although there are no developed areas, an undetermined amount of fishing, hiking, trapping, boating, and canoeing does take place. Some support for the Recreational River designation has been exhibited by various groups and private individuals. However, no Congressional action has occurred on this proposal, to date.

4.9. Aquatic Ecosystem

Plankton. Plankton are minute plant (phytoplankton) or animal life (zooplankton) in an aquatic system that float passively or swim weakly. Phytoplankton are the primary producers in most aquatic ecosystems and represent the first link in the aquatic food chain. Few studies of Kansas River plankton communities have been conducted and much of the available information is old and often sketchy. Powers (1969) has listed 225 species of phytoplankton for the Kansas River system, including all tributaries. The Fishery-Dredging Study (Cross et. al., 1982), which was the most comprehensive study ever conducted on the lower Kansas River, resulted in the collection of 33 species of phytoplankton. In general, the plankton community in the Kansas River is highly variable and influenced greatly by season and the discharges from the upstream lakes.

No specific studies have addressed the zooplankton communities of the Kansas River (Burns & McDonnell, 1982). However, their numbers and densities are expected to be low. Zooplankton require slow or still water to feed and reproduce and large river habitat is generally not suitable for zooplankton establishment.

Benthos. Benthos are organisms that live on or in the bottom of aquatic systems. Of five studies of benthos reviewed, four were conducted in the Kansas City area and the fifth, in the Lawrence area. The greatest number of species collected (65) occurred during the Fishery-Dredging Study. The species collected during all these studies suggest a somewhat polluted environment in the lower river, although this condition now appears to be improving (Burns & McDonnell, 1982). A major limiting factor to benthic organisms in the Kansas River is the dominance of the shifting sand substrate found throughout the river.

Fish. A large number of fish species have been reported as occurring in the Kansas River. Many of the fishes are typical of large, turbid rivers and include rough, game, and forage fish species of the sunfish, minnow, sucker, catfish, gar, sea bass, perch, and drum families. Their presence and abundance at any location in the Kansas River are generally related to their preference for one of the following habitats: pool, riffle or tributary.

The Kansas River is characterized by a constantly shifting sand substrate, and by a lack of fish habitat diversity. Both are limiting factors on fish populations. Additional information on fish populations in the Kansas River is contained in Cross et. al. (1982) and Burns & McDonnell (1982).

4.10. Terrestrial Ecosystem

In general, two types of terrestrial ecosystems occur in the study area. The first includes the riverbank and the area immediately adjacent, and the second, the remainder of the flood plain.

The riverbank ecosystem is characterized by narrow bands of terrestrial vegetation on the river's edge which rarely exceed 100 feet in width. It also includes islands located within the river channel. Plant species present here represent a series of successional changes relating to the frequency of inundation. These range from small willows at the waters edge to mature cottonwoods on the high bank. The wildlife which use this area are the more water-oriented species such as shorebirds, beaver, muskrat, and raccoon.

In regard to the floodplain ecosystem, it should be first noted that this system is severely reduced or does not exist in the urban areas. Further, it is in the urban areas in which most of the dredging is occurring.

The floodplain ecosystem is primarily affected by agricultural practices and is therefore dominated by cropland. Other vegetative community types in the ecosystem are deciduous

forest, grasses and forbs. Like the riverbank ecosystem, the plant species present represent a series of successional changes which are related to the frequency of inundation. Of primary significance to wildlife is the edge between the timbered areas lining the river and the associated croplands adjacent to the timbered areas. Such edges are highly productive for many wildlife species such as deer, fox, rabbit, quail and songbirds, and in more intensively farmed areas provide the only suitable habitat for wildlife. Additional information on the terrestrial ecosystem found along the Kansas River is contained in Burns & McDonnell (1982).

4.11. Threatened and Endangered Species

The U.S. Fish and Wildlife Service (FWS) has identified seven Federally endangered and/or threatened species; the bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus), least tern (Sterna antillarum), piping plover (Charadrius melodus), Eskimo curlew (Numenius borealis), Mead's milkweed (Asclepias meadii), and western prairie fringed orchid (Platanthera praeclara) which may be found in the immediate area of the Kansas River. In addition, the pallid sturgeon (Scaphirhynchus albus) has been proposed for listing as an endangered species and may occur in the general area.

In addition to the Federally listed, or proposed, threatened and/or endangered species, the State of Kansas also has an official listing for threatened and endangered animal species (Marvin Schwilling, 1985, and Larry Zuckerman, 1989. Kansas Wildlife and Parks, Personal communications). State endangered species which may be occasionally present in the commercial dredging study area are the pallid sturgeon (Scaphirhynchus albus) and sicklefin chub (Hybopsis meeki), and again the bald eagle and peregrine falcon. In addition, State threatened species which may occur in the study area are the flathead chub (Hybopsis gracilis), chestnut lamprey (Ichthyomyzon castaneus), snowy plover (Charadrius alexandrinus), Eastern hognose snake (Heterodon platyrhinos), and the northern crayfish frog (Rana areolata circulosa). The State of Kansas has designated critical habitat in and along the Kansas River for the flathead chub and the bald eagle.

4.12. Cultural Resources

Numerous historic, historic architectural, and archeological sites are located in a mile-wide corridor along the Kansas River between its mouth and headwaters. The banks of the river have not been systematically surveyed for cultural resources and it is probable that sites may be located in areas selected for dredging.

The greatest concentration of historic sites and historic architectural structures occur in the larger urban areas along the Kansas River. The Bowersock Dam, an 1870's structure, is located in the river at Lawrence, Kansas. In rural areas, many of the known sites are bridges positioned on the floodplain. The Marsh Arch bridge at Wamego, Kansas is potentially eligible for listing on the National Register of Historic Places.

Two known archeological sites, 14WB312 in Wabaunsee County and 14RY633 in Riley County, are adjacent to the river and could be affected by dredging operations. These sites require evaluation to determine their significance. Archeological sites can be potentially found in the banks, terraces and bluffs along the river.

Paleontological materials have been recovered from sand bars in the river. Finds of this nature are more abundant east of Manhattan, Kansas. Generally, the finds are single bones from fossil animal vertebrates which are redeposited from another location and not associated with human culture. However, human bones have also been recovered, most notably from the Bonner Springs, Kansas area. As these finds are isolated and out of their original context, their scientific value is diminished.

V. ENVIRONMENTAL EFFECTS

This section discusses the probable impacts which would result from implementation of the various alternatives. Many of the impacts are discussed in general terms as the alternatives represent possible policies that could be implemented by the Kansas City District. It is not possible to accurately predict at this time, the site specific effects of the Regulatory Plan. These site specific impacts would be addressed on an individual basis with each permit application. Most impacts that are discussed in this section are concentrated in the lower Kansas River between its mouth and Bowersock Dam (Lawrence) and in the Topeka area. These two reaches are the most intensively dredged on the Kansas River. Table EIS-1 provides a comparative display of the probable impacts of each of the three alternatives investigated.

For the Restricted Dredging alternative, a Monitoring Program would be established to collect data to evaluate the impacts of permitted dredging activities. These data would quantify the actual rate of riverbed degradation, bank erosion, channel widening, and other parameters affecting the river's morphology and ecology. In addition, these data would also be used in assessing impacts to any public and private interests in and along the Kansas River. Adjustments to the Regulatory Plan would be possible if monitoring reveals that certain restrictions in the plan can be lessened or eliminated, without exceeding the established level of impacts.

5.1. Dredging Industry

No Action (Dredging Industry)

The "No Action" alternative, in which dredging operations would be permitted to continue without new restrictions, would have a minor effect on the dredging industry. Changes that would occur would be a result of the demand in the market for aggregate, and the availability of adequate material to meet this demand. At a minimum, it is assumed that existing dredging operations in the lower reach of the river would slowly move upstream of Bonner Springs as the downstream supply of sand and gravel is diminished. These moves have been anticipated by the industry for some time. Assuming that the present operators would wish to reserve a dredging location in the Bonner Springs to De Soto reach, while staying as close as possible to the Kansas City markets, a scenario has been developed for describing migration into and movement within the mid-river. This scenario predicts a move after 7-10 years. (NOTE: This is the same scenario used by Simons, Li and Associates (1985) to develop a model that predicts future channel changes.)

The total cost for a dredge operator to move upstream consists of four main component costs: (1) New land must be acquired for the on-shore processing area; (2) A site plan may be needed to obtain zoning; (3) Improvements may be needed to existing township and county roads to handle the increased volume of truck traffic and weight of loads; and (4) the existing dredging operation must be disassembled, physically moved, and reassembled at the new site.

Averaging the total cost for this move over the 7-10 year period, and assuming that the typical operation would continue to produce 300,000 tons annually, this move would add approximately $0.05 to the production cost of a ton of sand. However, if the producer wishes to remain competitive with producers on the Missouri River, this cost may be absorbed with a corresponding decrease in profit margin.

This analysis is only for those dredgers operating on the lower Kansas River. Within the Lawrence area and upstream, no impacts are anticipated since the existing operations would be able to stay within their already permitted area.

Cessation of Dredging (Dredging Industry)

Cessation of dredging would have a severe economic impact on the Kansas River dredging industry. Assuming the same demand for aggregate, the degree of impact would depend on the ability of the individual firm to find an alternative source of aggregate at a comparable cost. Two plausible alternative sources seem evident. One is land mining within the floodplain. The other, for those in the Kansas City Metropolitan Area, is to obtain material from the Missouri River. For operations currently producing dry sand from the Kansas River, land mining within the floodplain would be their only alternative as the Missouri River is not considered to be a viable alternative due to its low silica content (Booker Associates, 1986).

Analyses of the impacts to the dredging industry for both alternatives follow. The analyses are based on the "typical" operation referenced earlier in the "Affected Environment" section. To reiterate, a typical operation produces an average of 300,000 tons of aggregate annually with an investment of $1.255 million and uses an average of 12 employees (Booker Associates, 1986). The aggregate is produced at an average estimated cost of $2.48 per ton and sold at $2.75 per ton for an average estimated profit margin of 9.8 percent. This price does not include transportation costs.

In a land mining operation, the same equipment that is used to dredge aggregate from the river could be used, although the repair and maintenance of the equipment is expected to be less. However, there are two additional costs; one for the land needed for the pit and the other for removal of the overburden (soil covering the sand deposits). It should be noted that the

overburden removal costs could be offset by possibly selling the material for fill. Taking into account these factors including the cost for removal of the overburden, and holding labor, overhead, and equipment life equal to that for the existing river dredging operations, the estimated cost to produce a ton of aggregate from a land pit is $2.95 per ton. This is a 19 percent increase in production cost over that estimated for dredging in the Kansas River. In order to retain a 9.8 percent profit margin, the average sale price would increase to approximately $3.27 per ton, which is also a 19 percent increase in the sale price. In addition, it should be noted that changes in local zoning would be needed for any new land mining operations. It is anticipated that these zoning changes may be controversial and difficult to obtain.

A shift in operation to the Missouri River would cause more of an impact to the dredging industry. Although this impact has been assumed to be related to the lesser desirability of the aggregate from the Missouri River, the impact is more related to the volume of material extracted. Unless the "typical" operation was able to substantially increase its sales volume (up to 500,000 tons), a move to the Missouri River would result in an estimated production cost of $4.14 per ton, an increase in cost of 67 percent over that estimated for dredging in the Kansas River. This increased production cost results from differences in operating procedures and equipment necessary to dredge the Missouri River, as described in Booker Associates (1986). In order to retain a 9.8 percent profit margin, the average sale price would in turn need to rise to $4.59 per ton. However, with the existence of high volume producers on the Missouri River who are able to sell their products at competitive prices, a "typical" Kansas River producer of 300,000 tons per year would not opt for a Missouri River operation. Booker Associates (1986) estimated that a minimum production volume of 500,000 tons per year would be necessary for a Missouri River plant to remain competitive within the Kansas City market, given the estimated level of investment required. This tonnage estimate is based on the amount of production necessary to bring the cost per ton down to a competitive level with the Kansas River operations. Four of 6 active operations on the lower Kansas River in 1987 did produce in excess of 500,000 tons. In addition, one Kansas River producer does have operations on both the Kansas and Missouri Rivers while another Kansas River producer has a permit to operate on the Missouri River but has not started operations. Any increase in average sale price for sand is expected to be minimal in order to remain competitive with existing Missouri River producers.

It is anticipated that if dredging was eliminated on the Kansas River, the smaller, (mostly upstream) operators would relocate to the floodplain while most of the larger (downstream) operators would relocate to the Missouri River.

Restricted Dredging (Dredging Industry)

The various features which comprise the Restricted Dredging alternative (see the Regulatory Plan in Appendix A) would impact the dredging industry more severely than the "No Action" alternative but less severely than the Cessation of Dredging alternative. None of the restrictions, however, are expected to force a producer out of business, although their profit margin may drop. Impacts associated with the Restricted Dredging alternative would be lessened by a gradual phasing in of this alternative over a 3 year period. Three major features of the Restricted Dredging alternative are anticipated to result in most of the impacts to the Kansas River dredgers; (1) level of allowable bed degradation, (2) quantity of material extracted by each dredge, and (3) quantity of material extracted from specific reaches of the river.

The maximum level of riverbed degradation, as established by the Kansas City District, would be 2 feet averaged over a 5-mile reach of river (see Regulatory Plan, Appendix A, for further details). If a reach of river would approach 2 feet of bed degradation, dredging activities would be altered or terminated before unacceptable impacts occur. If a 5-mile reach of river exceeds the 2-foot limit (regardless of the cause), dredging activities would be terminated. This feature would impact the dredgers by forcing them to move, probably upstream, as the riverbed reached its maximum allowable 2 foot level of degradation. The initial moves from the lower river upstream have been anticipated and planned for by the dredgers. Analysis of the impacts associated with the frequency of upstream moves is not possible because the following items are not known: The number of operations which would move upstream; the time at which they would move; or the location to which they would move. It is expected that moves would be minimized (possible once every 20 years) as a result of extraction limits placed on both individual dredges and for specific reaches of the river. The cost of moving would be the same as that described previously for the "No Action" alternative.

The proposed Regulatory Plan would require that the quantity of material extracted by a single dredge be restricted to 300,000 tons per year. This limit would be dependent on the number of dredges operating within a given reach of river (see Regulatory Plan, Appendix A, for further details). This limit would only affect the larger operations; in 1987, 4 out of the 6 active dredges on the lower Kansas River produced over 300,000 tons.

Another major feature of the Restricted Dredging alternative is a 1 million ton annual extraction limit proposed for the extreme lower Kansas River below Bonner Springs, (R.M. 21.2) Kansas (see Regulatory Plan, Appendix A, for further details). This extraction limit would significantly affect the existing dredgers in this reach. Current rates of extraction for this reach have averaged 2.91 million tons per year since 1984; 1.91

million tons more than the proposed 1 million ton annual extraction limit. It is anticipated that this excess demand could be met by various sources including; (1) producers that may move upstream of Bonner Springs on the Kansas River, (2) existing high volume producers on the Missouri River, (3) future Missouri River producers who may relocate from the lower Kansas River, and (4) future land mining operations that may result from the relocation of lower Kansas River producers. Significant quantities of sand would still be available on the Kansas River, upstream of Bonner Springs, under the Regulatory Plan. The fact that the demand for sand by the construction industry will always exist, will assure that some alternative source of sand is utilized. While it is impossible to say what actual mechanism would come into existence, the eventual development of new sources would be inevitable if production from the extreme lower Kansas River is seriously restricted.

The exact method for allocating the 1 million tons of sand in the extreme lower Kansas River is not known, at the present time. This allocation would be dependent on the number of operators that apply for permits in this reach of river and also their desired location and quantities. It is anticipated that the 1 million tons would be divided among the existing operators on the lower river. New dredge operators would only be permitted based on the availability of sand with the constraints set by the Regulatory Plan (See Appendix A).

The Restricted Dredging alternative would reduce the quantity of sand that could be removed from the lower Kansas River. It is generally true that in a commodity market with a constant demand, that a restriction in supply will cause prices to rise. It is anticipated that dredge operators on the lower Kansas River would have adequate time to alter their method of sand production, during the phasing in of the Regulatory Plan (3 years), to assure that an adequate supply of sand is available to satisfy demand. This time interval should minimize price increases resulting from implementing the Restricted Dredging alternative. It should be noted that the September 1988 price per ton of sand for concrete, in Kansas City ($3.00), is well below most other major cities as presented in Table EIS-3.

5.2. Sand and Gravel Market

No Action (Sand and Gravel Market)

The "No Action" alternative would not cause a significant increase in the initial sale price of sand removed from the lower Kansas River. However, this alternative would result in an increased delivered price for sand, assuming the average haul distance would increase by 15 miles as existing operations move upstream. This figure was derived by comparing the geographic center of the existing dredging operations in the lower river to the geographic center after the operations move upstream, over time. These locations are the I-435 and De Soto highway bridge

crossings (R.M. 15.5 and R.M. 31.0), respectively. At an average cost of $0.125 per ton mile, and assuming an average haul length of 20 + 15 = 35 miles (Booker Associates, 1986), the average delivered price of aggregate would increase $1.88 from its present average delivered price of $5.25 per ton (Table EIS-9). This 36 percent price increase would reduce some of the competitive advantage that Kansas River producers presently have over other producers in the region. The cost of sand in the construction of a typical 1,600 square foot home, using 40 tons of sand, would now be $285.20 and represent 0.4 percent of the $64,000 total construction costs; an increase of 0.1 percent above the existing conditions.

This analysis is only for those dredgers operating on the lower Kansas River. Within the Lawrence area and upstream, no effects are anticipated since the existing operations would be able to stay within their already permitted area.

Table EIS-9
Existing and Future Sand Prices (Averages)
Kansas City Metropolitan Area

	Sale Price at Plant	Cost of Hauling	Delivered Price
No Action			
Existing Kansas River	$ 2.75	$ 2.50	$ 5.25
Future Kansas River	2.75	4.38	7.13
Cessation of Dredging			
Land Mining	3.27	4.38	7.65
Missouri River	2.75	3.75	6.50

Cessation of Dredging (Sand and Gravel Market)

Cessation of dredging, and the resultant shift of operations to the Kansas River floodplain and/or the Missouri River would result in an increased sale price for sand. Since the cost of production per ton from land mining and Missouri River dredging are both greater than from existing dredging operations, it is expected that the sale price of a ton of aggregate would also be greater. These prices, for a "typical" operation producing 300,000 tons a year, have been estimated at $3.27 and $4.59 per ton, respectively. However, with the existence of high volume

producers on the Missouri River who are able to sell their products at competitive prices, a "typical" Kansas River producer of 300,000 tons per year would not opt for a Missouri River operation. Booker Associates (1986) estimated that a minimum production volume of 500,000 tons per year would be necessary for a Missouri River plant to remain competitive within the Kansas City market, given the estimated level of investment required. This tonnage estimate is based on the amount of production necessary to bring the cost per ton down to a competitive level with existing Kansas River operations. This competition should keep increases in the sale price of sand to a minimum.

It is anticipated that the probable locations for future land mining operations would closely correspond with the location of future Kansas River dredging operations (since future operations are expected to move upstream). Therefore, the average haul length would increase by 15 miles from the existing 20 miles. The delivered price of sand would increase by $2.40, from $5.25 to $7.65 per ton, as a result of increased production and hauling costs (Table EIS-9). This represents a 46 percent increase over the present average delivered price per ton. The cost of sand in the construction of a typical 1,600 square foot home, using 40 tons of sand, would now be $306.00 and represent 0.5 percent of the $64,000 total construction costs; an increase of 0.2 percent above the existing conditions.

Missouri River dredging would probably increase the average haul length by approximately 10 miles (Booker Associates, 1986), resulting in a $1.25 increase in the average delivered price. This increase in transportation cost would result in an average delivered price of $6.50 per ton, a 24 percent increase over the present average delivered price per ton (Table EIS-9). This price assumes no increase in production costs as a result of competition with existing Missouri River producers. The cost of sand in the construction of a typical 1,600 square foot home, using 40 tons of sand, would be $260.00 and represent 0.4 percent of the $64,000 total construction costs; an increase of 0.1 percent above the existing conditions.

Restricted Dredging (Sand and Gravel Market)

The various features which comprise this alternative would affect the local sand and gravel market. However, these effects should be minimized by a gradual phasing in of this alternative over a 3 year period and by the competition for a market share among the various producers. The 3 year phasing in period for the Regulatory Plan should provide enough lead time for Kansas River producers to alter their method of sand production, assuring that an adequate supply of sand would be available to satisfy demand. Price increases should be minimized as a result of competition from existing producers dredging from the Missouri River and those producers that would remain on the Kansas River. The exact impacts of this alternative can not be predicted without knowing

how the dredgers will react to the restrictions contained in the Regulatory Plan. It is anticipated that the cost of sand would be between those described for the "No Action" alternative and those for the Cessation of Dredging alternative (Table EIS-9).

5.3. River Morphology

No Action (River Morphology)

This analysis of impacts for the "No Action" alternative on river morphology is based on the results obtained from applying the continuity model (Simons, Li, and Associates, 1985) for various rates of dredging (Table EIS-10). This model can estimate the amount of degradation induced by the removal of a given quantity of sand and gravel by various combinations of dredges operating in a specific reach of the river. The general types of changes to the river channel which are predicted with the continuation of the existing dredging rate (Rate D) include further aggradation, further degradation, and no change (Table EIS-11). These predictions are for the 10-year period 1985-1995. Any prediction beyond 10 years was considered too uncertain.

In the upper river, upstream of Lawrence, there would be areas of aggradation, degradation, and no change which would occur with or without further dredging. In addition, in the Topeka area up to 2 feet of degradation would occur above that observed with the cessation of dredging (Rate A).

In the lower river, there would continue to be areas of aggradation, degradation, and no change. However, degradation at Lawrence and De Soto may surpass that observed with the cessation of dredging by approximately one foot. The higher level of degradation observed in the vicinity of De Soto is due to a combination of headcutting arising from downstream reaches, and from the expected initiation of dredging in the De Soto area. The dominant change in the extreme lower reach, downstream of De Soto and throughout the Kansas City metropolitan area, would be degradation ranging between 2 and 6 feet beyond the condition expected with the cessation of dredging.

TABLE EIS-10
SAND AND GRAVEL DREDGING RATES

Rate	Description
A	No dredging
B	1985 to 2015 rates: 1.15 million tons a year below Bowersock Dam 0.20 million tons a year at Topeka 0.02 million tons a year at Wamego 0.06 million tons a year at Manhattan Total amount dredged from 1985 to 2015 is 43.20 million tons
C	1985 to 2015 rates: 1.67 million tons a year below Bowersock Dam 0.40 million tons a year at Topeka 0.04 million tons a year at Wamego 0.12 million tons a year at Manhattan Total amount dredged from 1985 to 2015 is 66.96 million tons
D	1985 to 2015 rates 2.30 million tons a year below Bowersock Dam 0.40 million tons a year at Topeka 0.04 million tons a year at Wamego 0.12 million tons a year at Manhattan Total amount dredged from 1985 to 2015 is 85.80 million tons
E	1985 rates: 2.30 million tons a year below Bowersock Dam 0.40 million tons a year at Topeka 0.04 million tons a year at Wamego 0.12 million tons a year at Manhattan For Rate E only, the tons of material dredged from 1986 to 2015 have been compounded at an annual rate of 3 percent. Total amount dredged from 1985 to 2015 is 136.07 million tons

NOTE: These five rates were used with the MINING model to determine the potential for degradation of the riverbed associated with various rates of material extraction. Rate D is representative of the existing extraction rates. Rate B is 50 percent of Rate D's extraction. Rate C for the river below Bowersock Dam is representative of the average annual sand yield at De Soto as determined in Table 4.3 of SLA, 1984.
Source: Simons, Li, and Associates (SLA), 1985

TABLE EIS-11
RESULTS OF CONTINUITY MODEL, 1985 TO 1995

Net aggradation (+) in feet for the 10-year period, 1985 to 1995
Net degradation (-) in feet for the 10-year period, 1985 to 1995

Reach Number	River Mile	Rate A Mining (No Dredging)	Rate B Mining	Rate C Mining	Rate D Mining (Existing)	Rate E Mining
1	170.4 - 147.5	-1	-1	-1	-1	-1
2	147.5 - 121.5	+1	+1	0	0	0
3	121.5 - 101.2	0	0	0	0	0
4	101.2 - 101.0	0	0	0	0	0
5	101.0 - 93.0	+1	+1	+1	+1	+1
6	93.0 - 88.0 (Topeka)	0	-1	-2	-2	-2
7	88.0 - 80.6	0	-1	-1	-1	-1
8	80.6 - 64.5	0	0	0	0	0
9	64.5 - 51.9 (Lawrence)	-1	-1	-1	-1	-1
10	51.9 - 51.7	0	0	0	0	0
11	51.7 - 46.7	-1	-1	-2	-2	-2
12	46.7 - 41.6	0	0	0	0	0
13	41.6 - 34.8	-1	-1	-1	-1	-1
14	34.8 - 31.0 (De Soto)	-1	-2	-2	-2	-2
15	31.0 - 26.5	0	-2	-3	-3	-3
16	26.5 - 22.0	0	0	-1	-3	-2
17	22.0 - 15.1	0	-2	-2	-2	-3
18	15.1 - 14.9	0	0	0	0	0
19	14.9 - 12.4	0	-2	-3	-6	-11
20	12.4 - 12.2	0	0	0	0	0

Source: Simons, Li, and Associates, 1985

Cessation of Dredging (River Morphology)

The analysis of impacts for the Cessation of Dredging alternative (Table EIS-11, Rate A) on river morphology is again based on the results obtained from applying the continuity model (Simons, Li, and Associates, 1985).

Upstream of De Soto, there would still be some areas of aggradation, degradation, and no change. Levels of aggradation and degradation would be approximately one foot. In the lower river, downstream of De Soto, there would be no change.

Restricted Dredging (River Morphology)

The continuity model of Simons, Li, and Associates (1985) did not include the features contained in the restricted dredging alternative and is of limited use in assessing impacts due to the uncertainty of how the dredgers would adjust their operations under this alternative. The quantity of sand dredged with this alternative would approach that represented by Rate C or Rate D of the continuity model (Table EIS-10). For the sake of assessing impacts, the model results for Rate C and Rate D dredging (Table EIS-11), with a 2-foot degradation limit, represents a possible worse case scenario for this alternative. The proposed restrictions included in the Regulatory Plan would significantly minimize the adverse effects of dredging.

As limited by the Regulatory Plan, implementation of this plan could result in further degradation of up to an average of 2 feet in general, and 1-2 feet in certain local areas. These levels are expected to be reached over time in the lower reach of the river, but may never be reached in most of the upper river. It is likely that up to 2 feet of degradation would occur in the Topeka area. The exact amount of degradation resulting from this alternative would be documented by the proposed Monitoring Plan (Appendix A) and, if needed, changes in restrictions would be made to prevent unacceptable effects.

5.4. River Structures

No Action (River Structures)

The effects of the "No Action" alternative on structures located within the channel of the lower Kansas River and at Topeka would vary with the extent of degradation and/or bank erosion at each specific structure location. The structures discussed in this section are receiving special consideration over those in the remainder of the river because they are located in areas where substantial riverbed degradation has already occurred, or where it is expected to occur in the future without further regulation of commercial dredging. These specific channel conditions are based on results obtained from applying the continuity model of Simons, Li, and Associates (1985). When a predicted level of degradation

is discussed, the prediction is for the 10-year period 1985-1995, unless specified otherwise. Any extrapolation of data beyond this period of time increased the level of uncertainty of the results.

Bank Stabilization Structures. An approximation of the effect associated with 1-5 feet of further degradation to the bank stabilization structures between R.M. 8.2 and 51.8 (Bowersock Dam) and R.M. 84.0 - 87.7 (Topeka) was calculated by the Corps of Engineers by estimating the cost of placing additional rock that would protect the foundation of these structures. These costs range from $986,000 for 1 foot of degradation to $5,328,000 for 5 feet of degradation.

Highway Bridges. According to the Kansas Department of Transportation, further degradation of 5 feet or less would not affect existing bridge piers in the study area (W. M. Wright, 1985. Personal communication). This level of degradation is not expected during the 10-year period 1985 - 1995. However, this level of degradation, or greater, is predicted by the continuity model (under Rate E compounded dredging) for the 20 and 30 year periods in the reach of river encompassing the I-435 and K-7 highway bridges. Therefore, over a 20 to 30 year time period, implementation of this alternative may have an adverse effect on these bridges. Specific impacts to each bridge cannot be quantified. However, for the sake of discussion, it is assumed that if existing rates of dredging increase, some bridge piers would need to be modified. Such modification was required in the recent past for a highway bridge in Nebraska which is comparable in design to the K-7 bridge. The cost of this modification for two bridge piers was $237,000 (in October 1985 dollars).

Railroad Bridges. There are three railroad bridges that could be affected by implementation of this plan; the Santa Fe Railroad bridge (R.M. 21.2) at Bonner Springs, and at Topeka, the Santa Fe Railroad bridge (R.M. 83.7) and the Southern Pacific Railroad bridge (R.M. 84.5). The bridge at Bonner Springs has some recent history of structural problems due to channel degradation; in 1975, three of the six piers were strengthened at an estimated cost of $93,000 (C. L. Holman, 1986. The Atchison, Topeka and Santa Fe Railway Company. Personal communication).

At present, the Santa Fe bridge at Topeka has not experienced any structural problems due to channel degradation. This may be because there is no dredging activity immediately downstream of the bridge, unlike the Bonner Springs bridge. Implementation of this alternative may require the strengthening of all 6 piers at the Bonner Springs bridge and, sometime in the future, 4 of the 6 piers at the Topeka bridge. Railroad company representatives have indicated that this work would be needed if 5 feet of bed degradation occurred at these bridge locations. The model of Simons, Li, and Associates (1985) does not predict such levels to occur within the 1985 to 1995 period. However, it does predict 6-8 feet for 1985-2005 at Bonner Springs and 3 feet for 1985-2015 at Topeka. The estimated cost for this work, based on previous costs, would be $403,000 and $268,000, respectively.

The Southern Pacific Railroad bridge, at Topeka, has recently experienced increased bed degradation (J. F. Lynch, 1986. Southern Pacific Transportation Company. Personal communication). It is anticipated that sometime in the future, this bridge would also require strengthening of its piers.

Pipeline, Cable Crossings. The effects of the "No Action" alternative to the 19 pipeline crossings and single cable crossing, which occur in the lower Kansas River between R.M. 6.0 and Bowersock Dam (Lawrence) and in the Topeka area, are summarized in Table EIS-12. No pipeline crossings below the most downstream dredging operation (R.M. 6.0 - 7.0) were included in this analysis. The data on the elevations of the pipelines were obtained from the various pipeline companies. Complete information was not available for all crossings. The expected levels of degradation were obtained as output from the continuity model for the period 1985-1995, Rates D and E dredging (Table EIS-11).

A comparison of the elevation of the top of the pipeline or cable to the lowest bed elevation, after further degradation has been accounted for, suggests that three crossings may be affected. Eleven crossings should not be affected, and the impact to the remaining six is unknown. For the pipelines that would be affected by channel degradation, remedial measures to protect the pipelines include stabilizing with grout bags and lowering. Estimates obtained from a pipeline contractor in 1987 set the cost of stabilizing two 20 inch pipelines with grout bags at $135,000, while the cost of lowering the pipelines 3 feet and 5 feet would be $256,000 and $380,00 respectively. The estimate for pipeline lowering compares favorably with the actual cost ($750,000) of a lowering project on the Kansas River in 1979, where eight pipelines were involved.

Intakes. There are two intakes of concern in the study area, the Water District No. 1 intake at R.M. 15.0 and the water supply intake for the Sunflower Army Ammunition Plant at R.M. 32.9. An additional component of the Water District No. 1 intake is a weir which almost completely traverses the river immediately adjacent to the intake. A third intake and associated weir and jetties, is located at R.M. 87.0 in Topeka. This newly constructed structure has been designed to withstand the expected levels of degradation predicted for the Topeka area and therefore will not be discussed further.

At the Water District No. 1 intake, the continuity model predicts 6 and 11 feet of additional degradation will occur immediately downstream from the weir over the next 10 years (under Rate D and E dredging) (Table EIS-11). In a study by Burns & McDonnell (1986a) which investigated the impacts of continued riverbed degradation on water intakes on the lower Kansas River, two alternatives that would maintain the water supply function of the intakes were evaluated: (1) continued operation of the existing intake with maintenance of the jetty and low flow weir, and (2) construction of a new intake. The annual maintenance cost

for utilizing the existing structure was estimated to range from $21,000 to $62,000 for 1 to 5 feet of degradation, respectively. The cost estimate for a new intake was $3,195,000 with annual maintenance of $5,200 to $15,600 for one to five feet of degradation, respectively.

Given the same model inputs for the Sunflower Army Ammunition Plant intake, the predicted level of degradation is 2 feet. The Burns & McDonnell (1986a) investigation concluded that any further degradation of from 1 to 5 feet would significantly reduce intake capacity or cause total intake shutdown at average and minimum river flows. This report did suggest 3 alternatives: (1) a stone-filled low flow weir; (2) a coffer cell and low flow weir; and (3) a new intake. The cost estimate for each alternative was: (1) Stone-filled weir - initial construction cost ranging from $736,000 to $1,203,000 for 1 to 5 feet of degradation with annual maintenance of $44,000 to $83,000, respectively; (2) Coffer cell and weir - initial construction cost of $2,950,000 and annual maintenance of $10,400; and (3) New intake - initial construction cost of $3,621,000 and annual maintenance of $78,000.

Well Fields. Changes in river levels, as a result of riverbed degradation, are directly reflected in groundwater level changes in well fields adjacent next to the Kansas River. In general, lower groundwater levels directly affect well field operation by reducing pump capacities and by increasing energy requirements for pumping.

In a Burns & McDonnell (1986b) investigation, 6 groundwater users were identified as likely being affected by channel degradation and lower river stages. These users included Water District No. 1 of Johnson County (R.M. 11-12), Kansas; the cities of Bonner Springs (R.M. 20), Olathe (R.M. 28), and De Soto (R.M. 32), Kansas; the Sunflower Army Ammunition Plant (R.M. 31 and 34), and miscellaneous industrial and irrigation wells along the lower river. Three alternatives for mitigating the impacts of 1, 3, and 5 feet of bed degradation were investigated in this report: (1) Modification of well field operation and additional pumping energy; (2) Replacement wells and additional pumping energy; and (3) Purchase replacement water and additional pumping energy (Table EIS-13). Modification of well field operation and/or additional pumping energy was a feasible alternative for all 6 users with total estimated annual costs of $8,900, $17,700, and $17,400 for 1, 3, and 5 feet of degradation. This was not feasible for 5 feet of degradation at De Soto. The Replacement Wells alternative was only feasible at Olathe, De Soto, and the miscellaneous wells. Total estimated initial construction costs for 1, 3, and 5 feet of degradation were $596,000, $610,000, and $862,000, respectively. In addition, annual costs for maintenance and additional pumping energy were $500, $1,300, and $2,200. The alternative of purchasing replacement water was only viable for the Olathe well field and would cost $34,700, $44,700, and $50,700 annually for 1, 3, and 5 feet of degradation.

TABLE EIS-12
KANSAS RIVER PIPELINE AND CABLE CROSSINGS

Structure	River Mile	Lowest River Bed Elev	Elevation of top pipe at Bed Elev	Allowable Lowering	Expected Degradation Rates D & E	Expected Degradation Rate C with 2 feet limit	Potential Damage	Comment
8" pipeline, Wms Pipeline	9.0	714	715	0	*	*	Unknown	
10" pipeline, Phillips Petro	11.5	720	-	-	*	*	Unknown	Lowered 8' in 1979
8" pipeline, Phillips Petro	11.6	717	712	5	*	*	Unknown	Lowered 8' 1979
6" pipeline, KS Pipeline	11.6	719	712	7	*	*	Unknown	Lowered 8' in 1979
3-8" and 2-12" petro pipelines, Wms pipeline	11.6	719	712	7	*	*	Unknown	Lowered 8' in 1979
2-20" Gas lines, NW Central Pipeline	14.65	718 716	718-725 720-726	0	6-11	2	Yes	
2-8" and 1-10" pipeline, KS pipeline	16.5	722 724 724	725 725 724	0 0 0	2-3	2	Yes	
12" Force main Approx 875 ft. from river	16.6	740	737	3	2-3	2	No	
8" gas line on Hwy K-7 Bridge NW Cent. Pipeline	20.3						No	
Telephone cable, SW Bell	31.2	755	751	4	2	2	No	
16" water line Sunflower AAP	32.3	755	753	2	2	2	Yes	

*Continuity model not applied to this reach;

TABLE EIS-12 (cont.)
KANSAS RIVER PIPELINE AND CABLE CROSSINGS

Structure	River Mile	Lowest River Bed Elev	Elevation of top pipe at Bed Elev	Allowable Lowering	Expected Degradation Rates D & E	Expected Degradation Rate C with 2 feet limit	Potential Damage	Comment
8" fertilizer line Coop Farm Chem Assoc. (Wms Pipeline	49.6	788	781	7	2	2	No	
26" Gas line NW Cent Pipeline	49.75	788	781	7	2	2	No	
6-10" pipelines, NW Cent Pipeline	49.75	788			2	2	Unknown	Abandoned
18" sewer main City of Lawrence	50.9	787	778	9	2	2	No	
8" sewer line City of Lawrence	50.9	787	782	5	2	2	No	
6" Petro Line, Wms Pipeline	79.6	842	837	5	0	0	No	
8" pipeline, Magnolia Pipeline	79.8	842	833	9	0	0	No	
18" sewer main City of Topeka	82.8	843	831	12	1	1	No	
Sewer Main, City of Topeka	86.2	855	838	17	1	1	No	

TABLE EIS-13
WELL FIELD MITIGATION COST ESTIMATES

Alternative	Amount of Degradation (feet)	Construction Costs	Annual Costs
Modify well field operation and additional pumping energy	1	-	$ 8,900
	3	-	17,700
	5	-	17,400 (1)
Replacement well(s) and additional pumping energy (2)	1	$596,000	$500
	3	610,000	1,300
	5	862,000	2,200
Purchase replacement water and additional pumping energy (3)	1	-	$34,700
	3	-	44,700
	5	-	50,700

(1) Not feasible for De Soto with 5 feet of degradation.
(2) Feasible only for Olathe, De Soto, and the miscellaneous wells.
(3) Feasible only for Olathe.

Cessation of Dredging (River Structures)

Implementation of this alternative would minimize but not stop the potential for damage to selected river structures (see Table EIS-11). This is due to the dynamic nature of an alluvial river system, and the headcutting which will continue to occur as a result of past dredging. However, any additional impacts to river structures would be minimal.

Restricted Dredging (River Structures)

The limitations of the analysis to follow are the same as described under River Morphology, Restricted Dredging alternative. To reiterate, (1) the quantity of sand dredged would approach Rate C or Rate D of the continuity model (Table EIS-10); (2) Rate C and Rate D, with a 2-foot limit (Table EIS-11), would represent a possible worse case under this alternative; and (3) proposed restrictions included in the Regulatory Plan are anticipated to minimize adverse effects. The exact effect associated with this alternative would be documented by the proposed Monitoring Program. These impacts would be assessed and, if needed, changes would be made to the Regulatory Plan to prevent unacceptable effects to river structures.

Bank Stabilization Structures. In the worse case situation, the foundations of all bank stabilization structures in the areas of existing and expected degradation would have to be reinforced because of the 2 additional feet of degradation which would result from implementation of the Regulatory Plan. The estimated cost of this work is $2,028,000.

Highway Bridges. According to the Kansas Department of Transportation, further degradation of 5 feet or less would not affect existing highway bridges.

Railroad Bridges. Representatives of the Santa Fe Railroad indicated that their bridge at Bonner Springs was endangered in 1986, and that 5 additional feet of degradation would require strengthening efforts. It is anticipated that with any additional degradation (2 feet or less) the Bonner Springs bridge would require an undetermined amount of strengthening. The exact cost for this work, based on 2 feet of degradation, is unknown.

The exact effect of 2 feet of degradation or less at Topeka on the Santa Fe and Southern Pacific Railroad bridges is not known. Representatives from Southern Pacific have requested a minimum buffer distance of 1,000 feet upstream and downstream of their bridge to prevent further channel degradation and reduce scour potential. Representatives from the Santa Fe Railroad have indicated that their Topeka bridge is not yet in an endangered position, apparently since dredging operations are not occurring immediately downstream of the bridge. They did indicate that in time, the foundation of this bridge would also need protection to offset the degrading of the river bed.

Pipeline and Cable Crossings. The following worse case scenario discussion is based on the data provided earlier as Table EIS-12. Since the allowable lowering depth for three crossings is 2 feet or less, implementation of this plan may result in the same effects to the crossings as predicted under "No Action" -- 3 crossings may be affected, 11 crossings should not be affected, and the impact to the remaining 6 crossings is unknown. It is anticipated that the specific restriction on dredging near pipelines (see Regulatory Plan in Appendix A) would limit the potential for localized degradation and the resulting effects to pipeline crossings.

Intakes. There are 2 intakes of concern in the study area, the Water District No. 1 intake at R.M. 15.0 and the water supply intake for the Sunflower Army Ammunition Plant at R.M. 32.9. An additional component of the Water District No. 1 intake is a weir which almost completely traverses the river immediately adjacent to the intake. A third intake and associated weir and jetties, is located at R.M. 87.0 in Topeka. This newly constructed structure has been designed to withstand the expected levels of degradation predicted for the Topeka area and therefore will not be discussed further.

At the Water District No. 1 intake the continuity model predicts 3 to 6 feet of additional degradation immediately downstream over the next 10 year under Rate C and Rate D dredging (Table EIS-11). However, this model did not take into account the specific restrictions included in the Regulatory Plan. These restrictions are intended to limit the potential for bed degradation in the vicinity of the intakes. The discussion that follows represents the worse case scenario under this alternative with bed degradation limited to 2 feet.

In a study by Burns & McDonnell (1986a) which investigated the impacts of continued river bed degradation on water intakes on the lower Kansas River, two alternatives are discussed for the Water District No. 1 intake; (1) continued operation of the existing intake with maintenance of the jetty and low flow weir, and (2) construction of a new intake. The annual maintenance cost for utilizing the existing structure is estimated to range from $21,000 to $31,000 for one to two feet of degradation, respectively. The cost estimate for a new intake is $3,195,000 with annual maintenance of $5,200 to $7,800 for one to two feet of degradation, respectively.

Given the same model inputs for the Sunflower Army Ammunition Plant intake, the predicted level of degradation is 2 feet. The Burns & McDonnell (1986a) investigation concluded that for the Sunflower intake any further degradation of from 1 to 5 feet would significantly reduce intake capacity or cause total intake shutdown at average and minimum river flows. This report did suggest 3 alternatives: (1) a stone-filled low flow weir; (2) a coffer cell and low flow weir; and (3) a new intake. The cost estimate for each alternative is: (1) stone-filled weir - initial construction ranging from $736,000 to $836,000 for 1 to 2 feet of degradation with annual maintenance of $44,000 to $52,000, respectively; (2) coffer cell and weir - initial construction cost of $2,950,000 and annual maintenance of $10,400; and (3) new intake - initial construction cost of $3,621,000 and annual maintenance of $78,000.

Well Field. The discussion of the impacts to well fields that are anticipated to result from implementation of this alternative is the same as under the "No Action" alternative. However, bed degradation would be limited to 2 feet.

5.5. Water Quality and Groundwater

No Action (Water Quality and Groundwater)

It was concluded from the Fishery-Dredging Study (Cross et. al., 1982) that dredging had little or no demonstrable effect on the water quality of the Kansas River in the area of the dredges except locally where return flows re-entered the river. For example, the increased suspended solids concentrations which were observed at these points were not detectable 650 feet downstream. Therefore, no significant effect on the water quality of the

Kansas River would be expected within the "No Action" alternative. Similarly, the increased turbidity and increased suspended sediment concentrations resulting from the expected bank sloughing associated with further dredging would occur only on a local level.

Changes in groundwater levels adjacent to the Kansas River would be directly related to changes in the river channel. Areas of substantial bed degradation would result in lowering of the surrounding groundwater level. In the upper river, only at Topeka would any lowering of the groundwater level be expected. However, in the lower river, groundwater levels would be lowered at Lawrence and De Soto, and that stretch of river downstream of De Soto.

Cessation of Dredging (Water Quality and Groundwater)

The complete cessation of dredging on the Kansas River would benefit water quality to some degree. For example, implementation of this alternative would eliminate the sedimentation and turbidity that currently exists below the dredge water return outfall pipe, though the area that would benefit is relatively small. The trend toward small increases in the concentrations of certain parameters below operating dredges would also be curtailed as would the possibility for spills of oil and other pollutants. However, based on Cross et. al. (1982) the benefit to existing water quality from this alternative would be minimal.

As a result of the minimal amount of bed degradation that would occur under this alternative, little, if any, lowering of the groundwater level would be expected with the Cessation of Dredging.

Restricted Dredging (Water Quality and Groundwater)

Impacts to the water quality of the Kansas River in the immediate area of the dredges are expected to be basically the same as for the "No Action" alternative. There would be little or no effect except where the dredge return flows re-enter the river. In addition, there should be little or no increases in turbidity or suspended sediment concentrations resulting from bank sloughing because these effects are expected to be minimized under this alternative. Site specific water quality concerns would be addressed on an individual basis with each permit application.

As a result of the 2-foot limit on bed degradation that would be allowed under this alternative, only minimal lowering of the groundwater level would occur with the Restricted Dredging.

5.6. Floodway

No Action (Floodway)

There would be no impact to the floodway or flood frequency in the upper or lower reaches of the river with implementation of this alternative. In the De Soto area, as dredging operations increase, the area of the floodway may decrease somewhat as the new dredge pits increase the river's channel capacity. This may also reduce flood frequency and reduce flood hazard to some extent.

Cessation of Dredging (Floodway)

The output from the continuity model (Table EIS-11) suggests that the river channel in the upper reaches would exhibit a combination of aggradation, degradation and no change with the cessation of dredging. This scenario is similar to the pre-dredging condition. In the lower river, although there would be some "filling in" of the abandoned dredge pits, there would generally be no change. In general, the floodway and flood frequency should not change with implementation of this alternative.

Restricted Dredging (Floodway)

There should be no change to the actual floodway and flood frequency in the upper river with implementation of this alternative because areas of aggradation, degradation, and no change would continue to be present as before. There could be some limited decrease in the actual floodway and flood frequency in the De Soto area because the channel capacity of the river would increase with the initiation of dredging at this location. In the lower river, the effect would vary. As long as commercial dredging continues, the actual floodway may decrease in areal extent. However, as the dredging operations move upstream, the areal extent of the floodway would stabilize, as no net aggradation or degradation is expected.

5.7. Land Use

No Action (Land Use)

The output from the continuity model for Rates B-E dredging predicts further rates of degradation due to dredging, ranging from high to low, downstream to upstream, respectively (See previous section on River Morphology). The bank erosion which usually accompanies such degradation would adversely and proportionately impact an unknown quantity of land adjacent to the Kansas River, mainly in the lower river and at Topeka. The exact amount of land that would be eroded is not known. However, the 1984 Simons, Li, and Associates report states that the reach of river between the Turner Bridge (R.M. 9.6) and Bonner Springs (R.M. 22) has widened approximately 150 feet, since 1950, primarily as a result of dredging activities.

The existing dredging operations on the lower Kansas River require approximately 10 acres per operation for processing, storage, and office space (Booker Associates, 1986). Assuming all 10 operations downstream of Bonner Springs ultimately move upstream, an estimated 100 acres of land would have to be removed from its existing use to accommodate this need. Accordingly, this land use change would be accompanied by the abandonment of 100 acres downstream. The dredging operations above Bonner Springs are not expected to move, and therefore should not require additional land for support facilities.

Cessation of Dredging (Land Use)

The impact of this plan to land use depends on the response of the dredging industry to its implementation. Should the dredging industry decide to change their operations to land mining in the lower Kansas River floodplain, a change in land use would occur. For example, the "typical" dredging operation averaging 300,000 tons per year would require 4 surface acres per year (Booker Associates, 1986). Assuming a land pit operation would stay in the same location for a time equal to the average plant replacement period of 12 years, and would acquire a minimum of 12 years worth of land at one time, approximately 48 acres (4 acres/operation x 12 years) would be needed for each pit mine. In addition to the acreage necessary for the pit mine, an operation would also require approximately 14 acres for its office building, processing plant, on-site storage areas, and buffer zone. This would result in a total of 62 acres of land being needed for each operation. The 62 acres of land to be converted will most likely be prime farmland which is normally planted in corn, soybeans, milo or wheat. The sale of this land by the farmer would be on a willing buyer-willing seller basis.

Should the dredging industry turn to an alternate source of material unrelated to the Kansas River floodplain, land along the lower reach of the Kansas River would gain slight benefits from the cessation of dredging alternative because the loss of adjacent land due to bank erosion would occur at a slower rate. This process would not be completely curtailed, however, since other factors are also involved in bank erosion.

If the dredging industry turns to the Missouri River as an alternative source of material, approximately 15 acres of land, per operation, would be needed for an unloading site and slurry treatment facility (Booker Associates, 1986). This land also would most likely be prime farmland.

Restricted Dredging (Land Use)

The impacts on land use which would result from implementation of this plan would be a combination of those described for the "No Action" and Cessation of Dredging alternatives. The dredging operations in the upper river are not expected to be affected significantly by this alternative and

should not require additional land for support facilities. However, significant impacts would occur to the dredging operations on the lower Kansas River. Some operations would be permitted to move upstream, some may relocate to the floodplain, and some may move to the Missouri River. This would result in a loss of land of 10, 62, and 15 acres, respectively, per operation.

It is anticipated that land along the lower reach of the Kansas River would gain slight benefits from the restricted dredging alternative because the loss of adjacent land due to bank erosion would occur at a slower rate. This process would not be completely curtailed, however, since other factors are also involved in bank erosion.

5.8. Recreation

No Action (Recreation)

There would be no change in the recreational opportunities in the upper or extreme lower reaches of the Kansas River with this alternative. In the De Soto area, the initiation of dredging would increase somewhat the opportunity for powerboating and the use of other watercraft that require deeper water as results in dredge pits. This would occur at the expense of the sinuous, riverine environment that is preferred by canoeists.

Cessation of Dredging (Recreation)

There would be no change to existing recreation with implementation of this alternative.

Restricted Dredging (Recreation)

This alternative would impact recreation in a similar manner as the "No Action" alternative, but to a lesser degree. The restrictions contained in this alternative would limit the quantity of sand removed and therefore should minimize this impact.

5.9. Aquatic Ecosystem

No Action (Aquatic Ecosystem)

Plankton. There would be no change to the existing phytoplankton or zooplankton populations with implementation of this alternative.

Benthos, Fish. The sequential and cumulative impact of the various alternatives to the benthic and fish communities associated with dredge sites on the Kansas River can best be described by an understanding of the following overall scenario.

This scenario is based on the results of the Fishery-Dredging Study by Cross et. al. (1982). Even though this study was conducted on the extreme lower Kansas River (R.M. 25.0 to R.M. 9.3), results from the study are assumed to be basically comparable for all dredged reaches of the Kansas River. These condition types are used in describing the alternatives' effect on the aquatic ecosystem referred to in the remainder of the EIS:

Condition 1. Initially, the diversity of habitats, benthic organisms, and fishes increases in the vicinity of a dredging operation as the prevalence of sand substrate is reduced, as depth increases in the dredge pit, and as erosion upstream exposes gravel and rubble substrate.

Condition 2. Subsequently, habitat diversity diminishes gradually as sand is depleted and local movement of each dredge enlarges its pit area at the expense of nearby shallow areas, sandbars, and islands. Pool habitats expand but shallow areas that have coarse substrate and moderate to swift velocities remain, in or near the dredge site. The relative abundance of species in the benthos and fish population continues to change, but few if any species that occur in undredged parts of the channel are eliminated. Diversity indices remain high at the dredge sites. Large fishes, including several important food and game fishes (crappie, drum, white bass, carp) are proportionately more abundant than in undredged segments of the river.

Condition 3. Ultimately, continuous dredging creates nearly uniform habitats that are very different from those in undredged parts of the channel. The channel becomes wide and water-filled, with uniformly steep banks, sluggish flow, and silt substrate. Benthic organisms and fishes that are characteristic of shallow, sandy, braided channels decline, and many disappear. The total number of species declines to about half that in undredged segments of the river. Species that remain are characteristic of lakes, or rivers larger and deeper than the Kansas River. The dredge pit still affords habitat for pool-dwelling fishes and winter refuge for some additional species.

Condition 4. Potentially, the fauna is decimated as dredge sites are abandoned due to depletion of accessible sand and gravel. Deep pools that were maintained by dredging fill with silt, eliminating the remaining aspect of habitat diversity that sustains reasonably valuable and diverse benthic and fish communities at the dredge site. This result is most severe if low dams are installed below dredge

sites to retard degradation of the river bed, and if new dredge sites are established upstream from those abandoned. Upstream migration of dredging activity lengthens the impacted reach of the river and reduces dispersal of fishes from unimpacted reaches into the dredged areas farthest downstream.

The "No Action" alternative would gradually result in Type 4 conditions at dredging locations in the extreme lower river as the dredge operations move upstream. In the De Soto area, conditions would change over time. Initially Type 1 conditions would exist at the new dredge sites and, with time, Type 2 and 3 would prevail. The amount of time required for this progression would depend on the quantity of sand removed at each dredge site. The aquatic ecosystem in undredged reaches of river between dredging operations would basically remain in their natural state, dependent on the distance separating the dredge sites. Dredge sites at Lawrence and in the upper river presently exhibit Type 2 and 3 conditions. These conditions are expected to be maintained as the quantity of sand should not be depleted at these sites anytime in the near future. The aquatic ecosystem in most of the river would remain in its existing natural state, except locally at or near dredge sites.

Cessation of Dredging (Aquatic Ecosystem)

Plankton. There would be no change to the existing phytoplankton or zooplankton populations with implementation of this alternative.

Benthos, Fish. Implementation of the Cessation of Dredging alternative would initially result in Type 4 conditions as dredge sites are abandoned in the extreme lower river. With time, the aquatic ecosystem at these dredge sites and others, further upstream, would gradually revert back to their natural state. The aquatic ecosystem in undredged reaches of the river would remain in their existing natural state. Under this alternative, the potential for a diversity of habitats, benthic organisms, and fishes, as associated with dredge sites exhibiting Type 1 conditions, would be lost.

Restricted Dredging (Aquatic Ecosystem)

Plankton. It was concluded from the Fishery-Dredging study (Cross et. al., 1982) that there would be no change to the existing phytoplankton or zooplankton populations with implementation of this alternative.

Benthos, Fish. This alternative would gradually result in Type 4 conditions in the extreme lower river as dredge operations move upstream. In the De Soto area, conditions would change over time. Type 1 conditions would exist initially. These conditions would change to Type 2 and Type 3 with time. The restrictions contained in this alternative such as limits on the quantity of

sand removed, lengths of dredge pits, and distances between dredges would minimize the amount of Type 2 and Type 3 conditions. Dredging sites in the upper river presently exhibit Type 2 and 3 conditions, and are expected to remain so. With this alternative, the Kansas River aquatic ecosystem would remain in its existing natural state, except locally at or near dredge sites.

5.10. Terrestrial Ecosystem

No Action (Terrestrial Ecosystem)

The output from the continuity model for Rates B-E dredging predicts further rates of degradation due to dredging, ranging from high to low, downstream to upstream, respectively (See previous section on River Morphology). The bank erosion which usually accompanies such degradation would adversely and proportionately impact an unknown quantity of riverside vegetation and its associated wildlife.

The gradual relocation of the dredging operations upstream would also cause adverse impacts to the floodplain ecosystem because of the requirement for bankside support facilities (See previous section on Land Use).

Cessation of Dredging (Terrestrial Ecosystem)

This alternative would conserve the existing natural features of the Kansas River including its sand bars, rock deposits, islands, and riverside vegetation. The exact impact of this plan to the terrestrial ecosystem depends on the response of the dredging industry to its implementation. Should the dredging industry decide to change their operations to land mining in the Kansas River floodplain, approximately 62 acres of terrestrial flora and fauna, per operation, could be lost in the first 12 years. Should the dredging industry turn to the Missouri River as an alternative source of material, approximately 15 acres of land, per operation, would be needed (Booker Associates, 1986).

Should the dredging industry turn to an alternate source of material unrelated to the Kansas River floodplain, terrestrial resources in the lower reach would gain slight benefits from the cessation of dredging alternative because the loss of riverside and floodplain habitat due to bank erosion would occur at a slower rate. This process would not be completely curtailed, however, since other factors are also involved in bank erosion. On the other hand, it should be noted that bank erosion is a natural process of alluvial stream channels and can have positive effects on the terrestrial environment associated with streambanks. This occurs as a result of the development of successional habitat on the filling bank of the stream.

The cessation of dredging would have no impact on the terrestrial ecosystem of the upper river.

Restricted Dredging (Terrestrial Ecosystem)

This alternative has been formulated on the assumption that with its implementation, further bank erosion and channel widening would be minimized. Bank erosion results in the loss of riverside and island vegetation and its associated wildlife. Therefore, implementation of this plan should aid in conserving the existing natural features of the Kansas River including its riverside vegetation, islands, sand bars, and rock deposits. The gradual relocation of the dredging operations upstream, however, would cause some adverse impacts to the floodplain ecosystem because of the requirement for bankside support facilities. The extent of the impact was estimated earlier in this report to be 10 acres, per operation, every 7-10 years.

5.11. Threatened and Endangered Species

No Action

The gradual relocation of dredging operations upstream would cause adverse impacts to the floodplain ecosystem because of the requirement for bankside support facilities (See previous section on Land Use). However, neither the specific sites or the potential impacts to threatened and endangered species can be identified at this time. This concern would be addressed on an individual basis during the public interest review for each permit application.

Cessation of Dredging

In general, implementation of this alternative would have no obvious impact on threatened or endangered species in the study area. However, since specific sites for alternative sources of sand are not known at this time, specific impacts can not be assessed.

Restricted Dredging

As with the above alternatives, impacts to threatened and endangered species can not be assessed since specific sites are not known at this time. This concern would be addressed on an individual basis with each permit application (See Biological Assessment, Appendix D).

5.12. Cultural Resources

No Action

As the dredging operations in the lower river move upstream, bankside area would be required for support facilities. Numerous historic, historic architectural, and archeological sites are located in a mile wide corridor along the Kansas River that might

contain these support facilities. Therefore, the possibility for adverse impacts to these sites does exist, although neither the sites nor the potential impacts can be identified at this time. This concern would be addressed on an individual basis with each permit application.

Cessation of Dredging (Cultural Resources)

If this alternative were implemented, it is assumed that the existing dredging operations would shift to Missouri River or to land mining operations in the Kansas River floodplain. This shift could have an impact on those cultural resources which might be located at these new sites. However, until these sites are identified, no further assessment of impact can be made.

Restricted Dredging (Cultural Resources)

The impacts of this plan to cultural resources are the same as for both the "No Action" and Cessation of Dredging alternatives. Under this alternative, some dredgers would move upstream while others may relocate to the Missouri River or the Kansas River floodplain. Therefore, the possibility for adverse impacts to cultural resources at these new sites does exist. However, neither the sites nor the potential impacts can be identified at this time.

VI. LIST OF PREPARERS

Name	Discipline/ Expertise	Experience	Role in Preparing EIS
Mr. Glenn Covington	Fisheries, General Biology	7 yrs MO Dept of Conservation; 4 yrs, environmental studies, Corps of Eng.	Biological, water quality impacts, EIS Coordinator
Mr. Michael Bronoski	Fisheries, General Biology	6 yrs, fish mgmt biologist, KS Fish & Game Commission; 7 yrs, environmental studies, Corps of Eng.	Biological, water quality impacts
Mr. Thomas Gurss	Civil (Hydraulic) Engineering, River & Reservoir Sediment	3 yrs, construction; 1 yr, mgmt of sand & gravel plant; 10 yrs, river & reservoir sediment engineering studies, Corps of Eng.	River geomorphic impacts and monitoring of impacts; mgmt of study which resulted in recommendations for the Regulatory Plan
Ms. Mary Lucido	Planner, Cultural Resources	12 yrs, mgmt of archeological, historical, & historic architectural programs & resources, Corps of Eng.	Cultural Resources impacts to known sites
Mr. Lyle Marlott	Socio-economics	23 yrs, economic & social studies, Corps of Eng.	Management of socio-economic (contract) study
Mr. Robert Pearce	Civil (Hydraulic) Engineering, River & Reservoir Sediment	6 yrs, highway design; 8 yrs, open channel hydraulic design; 16 yrs, river mechanics, geomorphology, sediment & water quality engineering in rivers and lakes, Corps of Eng.	Prepared Monitoring Plan
Mr. Robert Smith	Ecologist	12 yrs, Regulatory Function Branch, Corps of Eng.	Project manager handling permit applications; Managed fisheries (contract) study; prepared Regulatory Report and Regulatory Plan; assisted EIS preparation.

VII. PUBLIC INVOLVEMENT

7.1. Scoping Meeting

Scoping is that part of the EIS process, involving public participation, during which the scope of issues to be addressed in the EIS are determined and their significance with respect to a proposed action is identified. During the preparation of this EIS, scoping consisted of two features, a scoping meeting and a comment sheet.

A public notice, with a enclosed comment sheet (Appendix B), was mailed to Federal, State, and local governmental agencies, along with interested citizens, prior to the Scoping Meeting held on October 9, 1985. Respondents to the comment sheet were asked to identify areas of their concern with respect to sand and gravel dredging in the Kansas River, the alternatives which would alleviate their concerns, and the beneficial or detrimental effects associated with each alternative. Twenty-five sheets were returned either by mail or at the Scoping Meeting. In addition, seven letters of comment were also received.

An estimated 100 persons attended the Scoping Meeting. The meeting consisted of a brief introduction on the purpose for the meeting after which the attendees were divided into groups and asked to identify their areas of concern, and the alternatives which would alleviate their concerns. Since the feedback requested in the comment sheets and from the groups was essentially the same, the results are presented together for comparison in Tables EIS-14 and EIS-15. Table EIS-14 displays the public concerns and Table EIS-15 shows the public's solutions to these concerns. The ranking of the solutions does not necessarily correspond to the concerns identified, and there is not a solution for each concern..

The following is a list of Federal, State, and local agencies, organizations, and individuals who were sent a notice of the scoping meeting.

US Department of Agriculture
Soil Conservation Service, State Conservationist (Kansas)

US Department of the Army
Sunflower Army Ammunition Plant

US Department of the Interior
Fish and Wildlife Service
National Park Service
Geological Survey

US Department of Transportation
Federal Highway Administration

US Environmental Protection Agency
Region VII

Honorable Robert J. Dole
Honorable Nancy Landon Kassebaum
Honorable Jan Meyers
Honorable Jim Slattery
Honorable John C. Danforth
Honorable Thomas F. Eagleton
Honorable E. Thomas Coleman
Honorable Ike Skelton
Honorable Alan D. Wheat

State of Kansas
Governor
Bureau of Design
Department of Health and Environment
Department of Transportation
Fish and Game (now Department of Wildlife and Parks)
Geological Survey
State Board of Agriculture
State Historic Preservation Officer
Water Office

Douglas County, Director of Public Works
Geary County, Public Works Director
Jefferson County, County Engineer
Johnson County, County Engineer
Leavenworth County, County Engineer
Leavenworth County, Highway Administrator
Pottawatomie County, County Engineer
Riley County, County Engineer
Shawnee County, County Engineer
Wabaunsee County, Road and Bridge Supervisor
Wyandotte County, County Engineer

State of Missouri
Governor

Kansas Local Officials
Bonner Springs, City Clerk
De Soto, City Clerk
Edwardsville, City Clerk
Eudora, City Clerk
Kansas City
Mayor
City Clerk/Manager
City Planning Director
Lawrence, City Clerk
Manhattan, City Clerk
Topeka, City Clerk
Topeka, Water Supervisor
Wamego, City Clerk

Missouri Local Officials
Kansas City, Mayor
Kansas City, City Clerk

Cottonwood Drainage District
Kaw River Drainage District
Kaw Valley Drainage District
Lenape Drainage Board
Monticello Drainage District
North Topeka Drainage District
Tri County Drainage District

Builders Sand Company and Victory Sand and Gravel Company
Consumers Sand Company, Inc.
Holliday Sand and Gravel Company
Hub Materials, Inc.
Kansas Aggregate Producers Association
Kansas Sand and Concrete Company, Inc.
Kaw Sand Company
Kaw Valley Sand and Gravel Company
Kershaw Ready-Mix Concrete and Sand Company, Inc.
Meier Ready Mix, Inc.
The Penny's Ready Mixed Concrete Company of Lawrence, Inc.
Wamego Sand Company, Inc.

Associated General Contractors of Missouri
Builders' Association of Kansas City
Kansas City Area Economic Development Council
Kansas Contractors' Association
Heavy Contractors' Association
Laborer's Local #1290
Santa Fe Railway, Division Engineer
Union Pacific System, District Engineer
City Service Gas Company
Phillips Petroleum Company
Williams Pipeline Company
Water District No. 1 of Johnson County, Kansas
Bowersock Mills Power Company
Kansas Power and Light Company
Kansas River Parkway Association
Sierra Club, Midwest Office
National Audubon Society
Kansas Chapter, American Fisheries Society
Dr. Wakefield Dort, Jr.
Dr. Frank Cross
Dr. Robert Smith
Walter A. Rieke
Raymond Coffey
John R. Stubbs

Table EIS-14
Areas of Concern Expressed By The Public
During the Scoping Process

Concerns	Number of Responses From Comment Sheets	From Groups
Economic impact of further regulation of commercial dredging	14	5
Degradation/Bank erosion	2	5
Contribution of upstream lakes to problem	2	5
Impact of further regulation on floodway	1	1
Maintain or increase recreation opportunities on river	1	2
Impact of further dredging on ecosystem	1	6
Impacts of pit mining	1	2
Impacts of further dredging on channel structures	1	3
Poor manner in which dredgers treat bank areas adjacent to their dredging operations	1	
Don't regulate dredging to such an extent that supply of sand is reduced	1	
Length of time required to obtain permit		1
If dredgers are forced to seek alternative source of aggregate, will there be a change in the quality of the material?		1
Does the Corps of Engineers really have the authority to regulate dredging?		1
Enforcement of existing regulations is not occurring		1
If the dredging industry is allowed to move upstream:		
Who will pay for road improvements?		1
Who is liable for any loss of land?		1
There will be increased congestion/dust		1

Table EIS-15
Solutions To the Areas of Concern
Identified During Scoping Process

Solutions	Number of Responses From Comment Sheets	From Groups
Maintain or establish minimum distances between dredges, and other dredges and structures	6	
Continue permitting dredging with the minimum restrictions imposed in the past	6	2
Strict enforcement of restrictions on dredging	2	1
Restrict dredging to certain locations or reaches	3	
Restrict dredging (general)	1	
Restrict dredgers from moving into new reaches of the river	1	
Restrict dredging during fish spawning	1	
Restrict quantity of material dredged at any one place	1	1
Restrict dredging in the reach of the river that has been identified as a potential recreational river	1	
Change upstream lake operations	2	2
Eliminate upstream dams		1
Stabilize river banks	1	1
Use public funds to pay for any damages which result from dredging		1
Improve riparian habitat		1
Relocate dredging operations westward		1

7.2. Statement Recipients

The following is a list of Federal, State, and local agencies, organizations, and individuals who have been provided a copy of this EIS. Those agencies or individuals that provided comments on the draft report and EIS are identified by an asterisk (*). The comments received from the public review of that report and EIS were incorporated into this final Regulatory Report and EIS. Those comments and the Corps responses may be found in Appendix B.

US Department of Agriculture
* Soil Conservation Service, State Conservationist (Kansas)

US Department of the Army
Sunflower Army Ammunition Plant

* US Department of Commerce

* US Department of Housing and Urban Development

US Department of the Interior
* Office of Environmental Project Review
Fish and Wildlife Service
Manhattan, Kansas
Grand Island, Nebraska
Columbia, Missouri
Denver, Colorado
National Park Service
Geological Survey

US Department of Labor

US Department of Transportation
Federal Highway Administration

US Environmental Protection Agency
* Region VII

Honorable Robert J. Dole
Honorable Nancy Landon Kassebaum
Honorable Jan Meyers
Honorable Jim Slattery
Honorable John C. Danforth
Honorable Christopher Bond
Honorable E. Thomas Coleman
Honorable Ike Skelton
Honorable Alan D. Wheat

State of Kansas
Governor
Bureau of Design
* Department of Health and Environment

* Department of Transportation
  Geological Survey
* State Board of Agriculture
* State Historic Preservation Officer
* Water Office
* Wildlife and Parks

State of Missouri
  Governor
* Federal Assistance Clearinghouse
  Department of Natural Resources

Kansas County Officials
  Douglas County, Director of Public Works
  Geary County, Public Works Director
  Jefferson County, County Engineer
* Johnson County, County Engineer
  Leavenworth County, County Engineer
  Leavenworth County, Highway Administrator
  Pottawatomie County, County Engineer
  Riley County, County Engineer
  Shawnee County, County Engineer
  Wabaunsee County, Road and Bridge Supervisor
  Wyandotte County, County Engineer

Kansas Local Officials
  Bonner Springs, City Clerk
  De Soto, City Clerk
  Edwardsville, City Clerk
  Eudora, City Clerk
  Junction City, City Clerk
  Kansas City
    Mayor
    City Manager
    City Planning Director
* Lawrence, City Clerk
  Manhattan, City Clerk
  Topeka, City Clerk
  Topeka, Water Supervisor
  Wamego, City Clerk

Missouri Local Officials
  Jackson County Legislature
  Kansas City, Mayor
  Kansas City, City Clerk

Other Interested Parties
  Mid America Regional Council
  Cottonwood Drainage District
  Kaw River Drainage District

Kaw Valley Drainage District
Lenape Drainage Board
Monticello Drainage District
North Topeka Drainage District
Tri County Drainage District
* Builders Sand Company and Victory Sand and Gravel Company
Consumers Sand Company, Inc.
* Holliday Sand and Gravel Company
Hub Materials, Inc.
* Kansas Aggregate Producers Association
* Kansas Sand and Concrete Company, Inc.
* Kaw Sand Company
* Kaw Valley Sand and Gravel Company
Kershaw Ready-Mix Concrete and Sand Company, Inc.
* Meier Ready Mix, Inc.
* The Penny's Ready Mixed Concrete Company of Lawrence, Inc.
Wamego Sand Company, Inc.
Associated General Contractors of Missouri
Builders' Association of Kansas City
Kansas City Area Economic Development Council
Kansas Contractors' Association
Heavy Contractors' Association
Laborer's Local #1290
Santa Fe Railway, Division Engineer
* Union Pacific System, District Engineer
City Service Gas Company
Phillips Petroleum Company
Williams Pipeline Company
* Water District No. 1 of Johnson County, Kansas
Bowersock Mills Power Company
Kansas Power and Light Company
Kansas River Parkway Association
Sierra Club, Midwest Office
National Audubon Society
Kansas Chapter, American Fisheries Society
Dr. Wakefield Dort, Jr.
Dr. Frank Cross
Dr. Robert Smith
Walter A. Rieke
Raymond Coffey
John R. Stubbs

Area News Media (newspapers, radio, and television)

Libraries (for Public Availability)
Kansas City, Missouri
Main Library
Kansas City, Kansas
Main Library
De Soto, Kansas
Lawrence, Kansas
University of Kansas
Topeka, Kansas
Kansas State University
Junction City, Kansas

Wamego, Kansas
Manhattan, Kansas
Johnson County, Kansas

7.3. Public Views and Responses

Responses to all comments made on the draft Regulatory Report and EIS have been prepared. They are presented in Appendix B - Public Involvement and Public Views and Comments, which is a part of this report.

VIII. INDEX, REFERENCES, AND APPENDIXES

Study Documentation

Subjects	Environmental Impact Statement	Regulatory Report (References Incorporated)	Appendixes (References Incorporated)
Affected Environment	16	19	
Alternatives	10	26	
Alternatives Retained for Further Study	10	26	
Aquatic Ecosystem	31, 57	21	
Areas of Controversy	5	3	
Comparative Impacts of Alternatives	13	26	
Coordination			C
Cultural Resources	33, 61		
Dredging Industry	16, 35	3	
Environmental Effects	35	19, 21	A-1, D
Features Eliminated from Further Study	10	33	
Floodway	30, 55		
Glossary	75		
Land Use	30, 55		
List of Preparers	63		
Major Conclusions and Findings	5	3	
Need For and Objectives of Action	9	3, 34	A-2
Planning Objectives	9	34	A-2
Public Concerns	9	3	B

Subjects	Study Documentation: Environmental Impact Statement	Regulatory Report (References Incorporated)	Appendixes (References Incorporated)
Public Involvement	64		B
Public Views and Responses	69		B
Recreation	31, 57		
References	77	2	
Relationship to Environmental Statutes and other Environmental Requirements	6		
River Morphology	24, 42	20	
River Structures	25, 45		A-6
Sand and Gravel Market	22, 39		
Scoping Meeting	64		
Statement Recipients	69		
Study Authority	9	1	
Summary	5		
Terrestrial Ecosystem	32, 60	21	
Threatened and Endangered Species	33, 61		D
Unresolved Issues	6		
Water Quality	29, 53	32	A-16

GLOSSARY OF TERMS

Aggradation - a general raise in elevation of a riverbed resulting from the deposition of sediment, detritus, or other material.

Benthos - organisms that live on or in the bottom of aquatic systems.

Cessation - to no longer allow an activity; to stop.

Continuity Model - a model that predicts the levels of erosion and sedimentation in the Kansas River based on river flow, sediment load, and amount of sand and gravel dredging.

Cultural Resources - the historic and archeological resources of an area.

Degradation - the general lowering in elevation of a riverbed resulting from the erosion of sediment, detritus, or other material.

Delivered Price - the final purchased price of sand and gravel including the sale price and transportation costs.

Dry Sand - a particular category of sand with a high silica content that is dried and used primarily in the manufacturing of fiberglass.

Floodway - defined in the National Flood Insurance Act of 1968 as the channel of the stream plus any adjacent floodplain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights.

Land Mining - the removal of sand and gravel from underground deposits within the floodplain.

Lower Kansas River - that part of the Kansas River downstream of the Bowersock Dam (R.M. 51.8) in Lawrence, Kansas.

Monitoring Program - a program set up to measure various physical features of the Kansas River for impacts resulting from dredging activities.

Plankton - minute plant (phytoplankton) or animal life (zooplankton) in an aquatic system that float passively or swim weakly.

Production Cost - the actual cost of obtaining (mining) sand and gravel for commercial sale.

Regulatory Plan - a plan to be utilized by the Kansas City District, Corps of Engineers in its administration of permit applications for commercial dredging activities on the Kansas River. This plan contains specific restrictions to limit adverse impacts associated with the dredging activities.

River Morphology - the various physical river features.

River Structures - various structures that have been constructed in, adjacent to, or across the river.

Sale Price - the actual purchase price of sand or gravel at the plant; production costs plus profit margin.

Scoping - that part of the Environmental Impact Statement (EIS) process, involving public participation, during which the scope of issues to be addressed in the EIS are determined and their significance with respect to a proposed action is identified.

Typical Operation - the standard equipment arrangement used by most dredge operations on the Kansas River. This operation consists of a dredge, on-shore processing equipment and sales office/scale. The dredges are floating hydraulic suction-type units with either a chain-in-ladder devise or rotating head to loosen the sand and gravel bed before it enters the suction tube. A pipeline mounted on pontoons conveys the dredged material to the on-shore processing area where it is cleaned, sorted by size, and stored in piles pending distribution to consumers.

Upper Kansas River - that part of the Kansas River upstream of the Bowersock Dam (R.M. 51.8) in Lawrence, Kansas.

REFERENCES

Booker Associates. 1986. Kansas River Dredging Operations, Baseline Study and Comparison of Alternatives. Report prepared for Kansas City District, Corps of Engineers, Contract DACW41-85-D-0048.

Burns & McDonnell, 1982. Report on the Cumulative Impacts of Commercial Dredging on the Kansas River: A Social, Economic, and Environmental Assessment. Report prepared for Kansas City District, Corps of Engineers, Contract Number DACW41-79-C-0017.

Burns & McDonnell, 1986a. Report on Kansas River Water Intake Investigations for the Regulatory Plan, Commercial Sand and Gravel Dredging, Kansas River. Report prepared for Kansas City District, Corps of Engineers, Contract Number DACW41-86-D-0024.

Burns & McDonnell, 1986b. Report on Kansas River Valley Groundwater Impact Investigations for Regulatory Plan, Commercial Sand and Gravel Dredging, Kansas River. Report prepared for Kansas City District, Corps of Engineers, Contract Number DACW41-86-D-0024.

Cross, F.B. 1967. Handbook of the Fishes of Kansas. University of Kansas, Museum of Natural History Misc. Publications 45:1-357.

Cross, F.B. and F.J. DeNoyelles, principal investigators, 1982. Report on the Impacts of Commercial Dredging on the Fishery of the Lower Kansas River. Report prepared for Kansas City District, Corps of Engineers, Contract DACW41-79-C-0075.

Kansas Fish and Game Commission. 1977. Kansas River Basin, Kansas, Preliminary Stream Survey.

Land Inventory and Development, Inc. 1979. Land Use Compilation Data for the Kansas River and Tributaries. Prepared for Kansas City District, Corps of Engineers. Contract DACW41-78-C-0053.

Pflieger, William L. 1975. The Fishes of Missouri. Missouri Department of Conservation.

Powers, R. E. 1969. Phytoplankton Found in the Kansas River System. Federal Water Pollution Control Administration. Kansas City, Missouri. NTIS (PB-260-159).

Simons, Li, and Associates. 1984. Analysis of Channel Degradation and Bank Erosion in the Lower Kansas River. Report prepared for Kansas City District, Corps of Engineers, Contract DACW41-83-C-0160

_____. 1985. Recommendations for a Plan to Regulate Commercial Dredging on the Kansas River. Report prepared for Kansas City District, Corps of Engineers, Contract DACW41-83-C-0160.

US Army Engineer District, Kansas City. 1977. Impact of Commercial Sand Dredging in the Lower Kansas River (Draft). Kansas City, Missouri.

_____. 1980. Reconnaissance Report on Water Resources Management for the Kansas and Osage River Basins in Kansas. Kansas City, Missouri.

REGULATORY PLAN
FOR
COMMERCIAL DREDGING ACTIVITIES
ON
THE KANSAS RIVER

APPENDIX A

TABLE OF CONTENTS

		Page
INTRODUCTION		A-1
DREDGING RESTRICTIONS		A-3
I.	Restrictions Concerning Riverbed Degradation	A-3
II.	Restrictions Concerning the Rate of Sand and Gravel Extraction from Specified Reaches of the River	A-4
III.	Restrictions Concerning the Rate of Sand and Gravel Extraction by an Individual Dredge	A-5
IV.	Restrictions Concerning the Length of Individual Permitted Dredging Operations	A-6
V.	Restrictions Concerning the Distance between Adjacent Permitted Dredging Boundaries	A-6
VI.	Restrictions Concerning the Number of Dredges Authorized under the Terms of an Individual Permit Document	A-6
VII.	Restrictions Concerning Manmade Structures	A-6
VIII.	Restrictions Concerning Natural Formations	A-11
IX.	Restrictions Concerning Water Quality	A-16
MONITORING PROGRAM		A-25
I.	General Information	A-25
II.	Control Sites	A-26
III.	Survey Ranges	A-26
IV.	Data Collection	A-27
V.	Aerial Photography	A-28

Page

LIST OF FIGURES

FIGURE A-1	BOWERSOCK DAM	A-17
FIGURE A-2	WATER DISTRICT NO. 1 WEIR AND A NATURAL ROCK DEPOSIT	A-18
FIGURE A-3	SUNFLOWER ARMY AMMUNITION PLANT WATER INTAKE STRUCTURE AND DIVERSION JETTY	A-19
FIGURE A-4	CITY OF TOPEKA DIVERSION JETTIES & WEIR	A-20
FIGURE A-5	MULTIPLE BANK STABILIZATION STRUCTURES	A-21
FIGURE A-6	NATURAL ROCK DEPOSIT	A-22
FIGURE A-7	IDENTIFICATION OF AN ISLAND	A-23
FIGURE A-8	TRIBUTARY MOUTH	A-24

INTRODUCTION

This Regulatory Plan has been developed to aid the Kansas City District, Corps of Engineers in its administration of permit applications for commercial dredging activities on the Kansas River. The Plan is intended to limit the magnitude of dredging-related impacts to the morphology and ecology of the river; to manmade structures located in and along the river; and to other public and private interests such as adjacent land, water supplies and recreation. Adverse impacts include: (a) riverbed degradation 1/; (b) bank erosion; (c) channel widening; (d) lowering of water surface elevations in the river channel; (e) lowering of water table elevations adjacent to the river; (f) a reduction in the structural integrity of bridges, pipelines, jetties, dams, weirs and other manmade structures; and (g) a loss of environmental values resulting from (a) through (e).

The adverse impacts that result from commercial dredging activities are being controlled by establishing a maximum acceptable level of impacts 2/ and by providing the restrictions necessary to keep impacts at or below the acceptable level. The maximum level of impacts established for purposes of this Plan is a level which will have only minor effects 3/ on the morphology and ecology of the river and on public and private interests located in and along the river.

This Plan is subdivided into 2 main parts, entitled Dredging Restrictions and Monitoring Program. The Dredging Restrictions consists of criteria developed to limit dredging-related impacts to an acceptable level. The Monitoring Program will utilize data collected from the river to evaluate the impacts associated with restricted dredging in order to ensure that the established maximum acceptable level of impacts will not be exceeded. Data collected through the Monitoring Program will be used to quantify the actual rate of riverbed degradation, bank erosion, channel widening, and other parameters affecting

---

1/ The term riverbed degradation refers to lowering of riverbed elevations.

2/ The term maximum acceptable level of impacts is defined for purposes of this Plan as the maximum level of impacts determined by the Kansas City District to be compatible with the overall public interest involved.

3/ The term minor effects, as used in this plan, is described as those effects which are not expected to have a significant impact on nondredging concerns such as adjacent landowners and various entities responsible for structures located in and along the river, nor would those effects be expected to unduly impact environmental resources.

the morphology and ecology of the river, and to evaluate related adverse impacts occurring to public and private interests located in and along the river. The data will ultimately be used to adjust the Dredging Restrictions, as needed over time, to assure that the established maximum acceptable level of impacts will not be exceeded, and/or to adjust the Restrictions if monitoring efforts reveal that certain constraints can be lessened or eliminated without exceeding the established acceptable level of impacts.

Every effort has been made to develop this Plan through the application of scientific principles. Due to the limitations inherent in predicting future changes in river morphology, some of the elements in the Plan are based upon professional judgment and experience. Development of the Plan has relied on information presented in economic, social, environmental and engineering studies prepared to address this activity; on information provided to the District by various involved parties; and on the information and experience acquired by the District over a decade of analyzing Kansas River dredging.

Formulation of this Plan has been based on the following objectives: (a) limit the adverse impacts associated with commercial dredging activities to an acceptable level; (b) minimize the economic hardships which may occur to the producers, related construction concerns and consumers; and (c) provide a plan which will treat all producers equitably. Due to the complex nature of the issues relating to commercial dredging activities on the Kansas River, it has not been possible to develop a plan that will entirely satisfy the interests of all of the involved parties. This Plan satisfies the overall public interest involved and represents a compromise between the extremes of the alternatives available to the Kansas City District.

DREDGING RESTRICTIONS

This section of the Regulatory Plan contains restrictions that have been developed to limit the adverse impacts associated with commercial dredging activities on the Kansas River. The restrictions are intended to limit those impacts to a level which will have only minor effects on the morphology and ecology of the river and on public and private interests located in and along the river. Implementation of the Dredging Restrictions in conjunction with the Monitoring Program is intended to ensure that the established maximum acceptable level of impacts will not be exceeded.

I. Restrictions Concerning Riverbed Degradation.

The magnitude of dredging-induced riverbed degradation is a key factor influencing the degree of instability of the river channel. Degradation of the riverbed results in secondary impacts such as bank erosion, channel widening, lowering of water surface elevations in the river channel, lowering of water table elevations adjacent to the river, alteration of aquatic and terrestrial habitat, and a reduction in the structural integrity of manmade structures. Since secondary impacts increase as riverbed degradation increases, the degree of dredging-induced river channel instability can be limited by controlling the amount of dredging-related degradation.

Based on all available information, the Kansas City District has determined that most reaches of the Kansas River cannot sustain more than approximately 2 feet of riverbed degradation (based on riverbed elevations on the date of implementation of this plan) before secondary impacts exceed acceptable levels. Therefore, the maximum allowable reduction in the surface elevations of the riverbed is 2 feet for all reaches of the river. The 2-foot maximum reduction in bed elevations will be measured as an average reduction 1/ in bed elevations through any 5-mile-long reach of river. If riverbed elevations in a 5-mile-long reach of river approach 2 feet of degradation, dredging activities which adversely affect bed elevations in that reach will be altered or terminated before unacceptable impacts occur. Further, if the average reduction of riverbed elevations in a 5-mile-long reach of river attains 2 feet (regardless of the cause), dredging activities which adversely affect bed elevations in that reach will be terminated.

1/ The average reduction in riverbed elevations through a 5-mile-long reach of river will be computed by the Kansas City District using data collected through the Monitoring Program. Any 5-mile-long reach of river is subject to riverbed elevation averaging. A 5-mile-long reach can begin at any location on the river and will extend 5 miles upstream or downstream of that location.

Due to the implementation of a monitoring program, it is estimated that most producers would have 2 - 3 years notice prior to closure of a dredged-out reach 1/ of river. However, if an unforeseen event such as a flood causes excessive lowering of the riverbed which requires the unexpected closure of a reach of river, the affected producers will normally be allowed to continue dredging in that reach for one year in order to allow sufficient time for the relocation of their dredging operations. A reach of river which has been dredged-out and closed to dredging will not be reopened until its riverbed elevations increase to an average elevation exceeding the established minimum for that reach, and until sufficient materials have accumulated to support renewed dredging activities for a reasonable period of time. Riverbed elevations will be determined with the aid of riverbed cross-section surveys and/or water surface profiles, as specified in the appropriate sections of the Monitoring Program. Riverbed degradation will be computed by subtracting future riverbed elevations and/or water surface profiles from base line data collected after implementation of this Plan.

II. Restrictions Concerning the Rate of Sand and Gravel Extraction from Specified Reaches of the River.

The rate 2/ of sand and gravel extraction from a reach of river is an important factor affecting the river channel's stability. The magnitude of instability induced into the river channel by dredging activities increases as the rate of extraction increases (channel stability decreases as the length of time utilized to reach a given level of degradation decreases). Therefore, greater channel stability can be obtained by limiting the rate of extraction within a reach of river to provide a reasonable period of time for the channel to adjust to declining bed elevations.

The following restrictions are being implemented to limit the rate of sand and gravel extraction from specified reaches of the river:

A. The Confluence of the Kansas and Missouri Rivers to the Atchison, Topeka and Santa Fe Railway Company Bridge at Bonner Springs (River Miles 0 - 21.2 (Approx.)).

A maximum of 1 million tons of sand and gravel can be extracted from this approximately 21.2-mile-long reach of river annually. Refer to Section VII.B.1.c. for an additional restriction

---

1/ The term dredged-out reach refers to any 5-mile-long or longer reach of river that degrades an average of 2 feet or more after implementation of this Plan.

2/ The term rate is defined for purposes of this report as tons/time.

concerning extraction rates within this reach.

B. The Atchison, Topeka and Santa Fe Railway Company Bridge at Bonner Springs to River Mile 48.0 (River Miles 21.2 (Approx.) - 48.0).

No total annual extraction limit has been established for this approximately 26.8-mile-long reach of river. However, the maximum amount of sand and gravel that can be extracted annually from any 15-mile-long section of river within this reach is 750,000 tons. A 15-mile-long section of river can begin or end at any location within this reach.

C. River Mile 48.0 to Bowersock Dam at Lawrence (River Miles 48.0 - 51.8 (Approx.)).

A maximum of 150,000 tons of sand and gravel can be extracted from this approximately 3.8-mile-long reach of river annually.

D. Bowersock Dam at Lawrence to the Confluence of the Kansas, Smoky Hill and Republican Rivers Near Junction City (Approx. River Miles 51.8 - 170.4).

No total annual extraction limit has been established for this approximately 118.6-mile-long reach of river. However, the maximum amount of sand and gravel that can be extracted annually from any 15-mile-long section of river within this reach is 750,000 tons. A 15-mile-long section of river can begin or end at any location within this reach.

NOTE: The 750,000 ton extraction limit, per 15-mile-long section of river, referenced in parts B. and D. of this section does not apply to part A. of this section.

III. Restrictions Concerning the Rate of Sand and Gravel Extraction by an Individual Dredge.

The rate of sand and gravel extraction by an individual dredge is an important factor affecting local 1/ river channel stability. The diameter and depth of the dredge hole as well as local degradation beyond the dredge hole increase as extraction rates increase. Local degradation and secondary impacts, such as bank erosion and channel widening, can be limited and greater local channel stability can be obtained by limiting the extraction rate of an individual dredge. Therefore, the maximum annual extraction rate by a single dredge regardless of its location on the river will be limited

---

1/ The term local refers to the area directly impacted by a working dredge. This area could be relatively small, extending only a few hundred feet from the dredge, or it could be quite large, extending many hundreds of feet upstream and/or downstream of the dredge.

to 300,000 tons of material. The actual allowable extraction rate for a single dredging operation may be less than 300,000 tons of material and will depend upon the reach of river being dredged and the number of dredges operating within that reach.

IV. Restrictions Concerning the Length of Individual Permitted Dredging Operations.

The maximum length of any reach of river authorized for dredging under the terms of a single permit is 1.5 miles. This restriction is intended to allow the producers fair access to the river by preventing any producer from using the permitting process to create an unfair advantage over other producers by securing a permit for an excessively long reach of the river. This restriction applies to any new dredging operation permitted after implementation of this Regulatory Plan. It does not apply to a dredging operation permitted prior to implementation of the Plan, unless subsequent to implementation of the Plan that dredging operation is altered (such as the relocation of dredging boundaries) to an extent that those changes require the issuance of a new permit document.

V. Restrictions Concerning the Distance between Adjacent Permitted Dredging Boundaries.

A minimum distance of 2,000 feet is required between the permitted reaches of adjacent dredging operations. This restriction will limit dredging-induced local channel instability, by maintaining at least a 2,000-foot-long undredged reach of river between adjacent dredges. This restriction applies to any new dredging operation permitted after implementation of this Regulatory Plan. It does not apply to a dredging operation permitted prior to implementation of the plan, unless subsequent to implementation of the plan that dredging operation is altered (such as the relocation of dredging boundaries) to an extent that those changes require the issuance of a new permit document.

VI. Restrictions Concerning the Number of Dredges Authorized Under the Terms of an Individual Permit Document.

The maximum number of dredges authorized to operate within a single permitted reach of river is 1. This restriction will limit dredging-induced local channel instability, by limiting the number of dredges within each permitted reach of river.

VII. Restrictions Concerning Manmade Structures.

A. Bowersock Dam.

This hydroelectric dam is located near river mile 51.8. It was constructed in 1872 and was enlarged in 1926. The exact construction details of the dam are unknown. The structure is believed to be relatively unstable, since the elevation of the riverbed downstream of the dam is considered to be marginally

adequate to prevent sliding failure of the structure. The dam acts as a riverbed control structure, and if it should fail, it could induce severe riverbed degradation, bank erosion and channel widening for many miles upstream.

Due to the apparent unstable condition of Bowersock Dam and its importance as a riverbed control and hydroelectric generating facility, the following restrictions are being imposed on the reaches of river located immediately upstream and downstream of the dam:

1. Dredging activities upstream of Bowersock Dam will not be allowed within approximately 750 feet of the dam. The actual distance will be controlled by part C. of this section, since two bridges are located immediately upstream of the structure.

2. Dredging activities downstream of the dam will not be allowed within 2,250 feet of the structure.

3. The maximum volume of material that can be extracted annually between river mile 48.0 and Bowersock Dam is 150,000 tons.

Due to the uncertainties involved in evaluating the stability of Bowersock Dam, it is not possible to determine how many feet the downstream riverbed elevation can be lowered before the dam will fail. Therefore, the reach of river located immediately downstream of the dam will be closely monitored, and if dredging activities on the river appear to be jeopardizing the integrity of the structure, additional restrictions will be imposed.

Refer to Figure A-1 on page A-17 for additional clarification on the restrictions imposed on the reaches of river located immediately upstream and downstream of the dam.

B. Water Intake Structures and Associated Weirs and Jetties.

No dredging will be allowed within 500 feet of any water intake structure or an associated weir or diversion jetty. This restriction will limit the potential for dredging-induced local channel instability to adversely impact the operation of such structures. This restriction does not apply to irrigation intakes.

The following additional restrictions are being imposed to protect the Water District No. 1 1/ weir; the Sunflower Army ammunition Plant water intake structure and diversion jetty;

1/ Water District No. 1 refers to Water District No. 1 of Johnson County.

and the city of Topeka's water intake structures, diversion jetties and weir:

1. Water District No. 1 Weir.

This weir is an important riverbed control located near river mile 15.0. The weir was initially constructed in the mid-1960s in response to continually lowering water surface elevations in that reach of river. If riverbed elevations downstream of the weir drop several more feet, the structure may fail. Failure of the weir could induce severe riverbed degradation, bank erosion and channel widening upstream of the structure and could impact water supplies for Water District No. 1 of Johnson County.

Due to the importance of the weir to Water District No. 1 for its water supply and due to the structure's importance as a riverbed control, the following restrictions are being placed on the reaches of river located immediately upstream and downstream of the weir:

a. Dredging activities upstream of the weir will not be allowed within 500 feet of the structure.

b. Dredging activities downstream of the weir will not be allowed within 2,500 feet of the structure.

c. The maximum volume of material that can be extracted annually between river mile 12.4 (the upstream end of a natural rock deposit) and the Water District No. 1 weir is 300,000 tons.

Refer to Figure A-2 on page A-18 for additional clarification on the restrictions imposed on the reaches of river located immediately upstream and downstream of the weir.

2. Sunflower Army Ammunition Plant Water Intake Structure and Diversion Jetty.

The Sunflower Army Ammunition Plant has a water intake structure and a diversion jetty located between river miles 32.9 and 33.1. The intake structure was constructed in 1944 and is currently not in use. The Sunflower Plant has established a riparian water right to draw 60 million gallons of water a day from the river; and although the intake is not currently in service, it must be maintained in an operable condition to meet possible future national emergency mobilization requirements at the plant.

Kansas River low flow water surface elevations at the water intake are presently critically low to meet the water supply demands of the plant if it were operating at its fully mobilized potential. Therefore, any lowering of riverbed elevations at the intake would have a detrimental impact on the plant's ability to meet possible future water supply needs.

Riverbed degradation near the intake could also result in failure or diminished function of the diversion jetty located just upstream of the intake structure. The jetty diverts flows from the left riverbank to the intake on the right riverbank. Loss of the jetty or diminished function of the structure could severely impact the plant's ability to meet future water supply needs.

Due to the importance of the water intake structure and diversion jetty to meet possible future mobilization requirements at the Sunflower Plant, the following restrictions are being imposed:

a. Dredging activities upstream of the intake structure will not be allowed within 5,000 feet of the structure.

b. Dredging activities downstream of the intake structure will not be allowed within 5,000 feet of the structure.

Refer to Figure A-3 on page A-19 for additional clarification on the restrictions imposed on the reaches of river located immediately upstream and downstream of the water intake structure and diversion jetty.

3. City of Topeka Water Intake Structures, Diversion Jetties and Weir.

The city of Topeka has 2 water intake structures, 2 diversion jetties and a weir located between river miles 86.9 and 87.2. These structures provide the city with its entire water supply. Low flow water surface elevations at the intakes are marginally adequate to meet the city's needs; therefore, any lowering of water surface elevations at the intakes could have a detrimental impact on the city's ability to withdraw water from the river. The diversion jetties divert flows from the left riverbank to the right bank where the intake structures are located. The weir functions like a dam, raising water levels upstream of the structure and increasing water surface elevations at the intakes. Loss of one of the diversion jetties or the weir or diminished function of the structures could severely impact the city's ability to meet its water supply needs.

Due to the importance of the city of Topeka's diversion jetties and weir to meet the city's water needs, the following restrictions are being imposed:

a. No dredging will be allowed between the most upstream jetty and the weir.

b. Dredging activities upstream of the diversion jetties and weir will not be allowed within 1,000 feet of the most upstream diversion jetty.

c. Dredging activities downstream of the diversion jetties and weir will not be allowed within 2,000 feet of the weir.

Refer to Figure A-4 on page A-20 for additional clarification on the restrictions imposed on the reaches of river located immediately upstream and downstream of the diversion jetties and weir.

C. Bridges.

No dredging will be allowed within 500 feet of any bridge crossing the Kansas River. This restriction will limit the potential for dredging-induced local channel instability to adversely impact the structural integrity of bridges.

D. Pipelines.

Pipelines buried in the riverbed have a high potential to be adversely impacted by dredging activities. If degradation of the riverbed exposes a pipeline, damage could occur through sagging, buoyancy or displacement of the line downstream due to an accumulation of debris. The following restrictions will limit the potential for dredging-induced localized degradation to expose buried pipelines:

1. No dredging will be allowed within 200 feet of any pipeline that is buried 10 feet or more below the riverbed's surface.

2. No dredging will be allowed within 500 feet of any pipeline that is buried less than 10 feet below the riverbed's surface.

Additional restrictions may be required for any pipeline located on or above the riverbed. Such restrictions would be developed on a case-by-case basis.

Each applicant is responsible for determining the locations and elevations of any pipelines crossing the river within a proposed permit's boundaries and within the reaches of river extending 500 feet upstream and downstream of those boundaries. This information or a negative response, if no pipelines exist, must be provided to the Kansas City District before a proposed permit can be issued.

E. Bank Stabilization Structures.

No dredging will be allowed within 200 feet of any bank stabilization structure. When multiple structures (jetties, hardpoints, etc.) are utilized as components of a single project, no dredging will be allowed within 200 feet of the most upstream and downstream structures or landward of a line drawn parallel to the riverbank and located 200 feet riverward of the riverward edge of each structure. These restrictions

will limit the potential for dredging-induced local channel instability to adversely impact bank stabilization efforts.

Refer to Figure A-5 on page A-21 for additional clarification on restrictions concerning multiple bank stabilization structures.

F. Levees.

No dredging will be allowed within 150 feet of the riverward toe of any functional levee located along the river. This restriction will limit the potential for dredging-induced localized channel instability to adversely impact the structural integrity of levees.

G. Other Structures.

Restrictions regarding other manmade structures not identified in this section will be determined on a case-by-case basis.

VIII. Restrictions Concerning Natural Formations.

A. Natural Rock Deposits in the River Channel.

Natural rock deposits located on or in the riverbed may act as riverbed controls and/or may increase aquatic habitat diversity. The importance of a rock deposit is dependent upon its areal extent, its thickness and other relevant factors. Since the physical characteristics of rock deposits vary widely from one to another, and since the value of a deposit is based on its physical characteristics, it is not possible to develop restrictions which will consider all possible contingencies. Therefore, restrictions concerning natural rock deposits will be developed on a case-by-case basis (except for 1. and 2. below).

Restrictions concerning two important natural rock deposits are as follows:

1. Natural Rock Deposit between River Miles 12.2 and 12.4.

This natural rock deposit is an important riverbed control, and in addition, it provides valuable habitat diversity for fish and other aquatic organisms. The exact length, width and thickness of the deposit is unknown. The rock deposit functions as a riverbed control, retarding upstream bed degradation in the approximately 2 1/2-mile-long reach of river located between the deposit and the Water District No. 1 weir. If the rock deposit is displaced by dredging activities, it could induce severe riverbed degradation, bank erosion and channel widening in the reach of river between the deposit and the weir, which could ultimately result in failure of the weir.

Due to the importance of the rock deposit as a riverbed control

and as valuable habitat for fish and other aquatic organisms, the following restrictions are being imposed:

a. Dredging activities will not be allowed within the reach of river containing the rock deposit (river miles 12.2 - 12.4).

b. Dredging activities upstream of the rock deposit will not be allowed within 500 feet of the deposit.

c. Dredging activities downstream of the rock deposit will not be allowed within 2,500 feet of the deposit.

Refer to Figure A-2 on page A-18 for additional clarification on these restrictions.

2. Natural Rock Deposit between River Miles 21.8 and 22.8.

This approximately 1-mile-long natural rock deposit is an important riverbed control. It also provides valuable habitat diversity for fish and other aquatic organisms, and during low river stages, it becomes a foraging area for wading and shore birds. The deposit extends from the right riverbank to within 200 - 300 feet of the left riverbank. The heavily dredged 21.8-mile-long reach of river located downstream of the rock deposit has significantly lower riverbed elevations than the undredged reach of river located upstream of the deposit. If the rock deposit is displaced by dredging activities, headcutting would proceed upstream from the heavily dredged downstream area and could induce severe riverbed degradation, bank erosion and channel widening in the reach of river located upstream of the deposit.

Due to the importance of the rock deposit as a riverbed control, as valuable habitat for fish and other aquatic organisms and as a foraging area for birds, the following restrictions are being imposed:

a. Dredging activities will not be allowed within the reach of river containing the rock deposit (river miles 21.8 - 22.8.

b. Dredging activities upstream of the rock deposit will not be allowed within 500 feet of the deposit.

c. Dredging activities downstream of the rock deposit will not be allowed in the reach of river located between the deposit and a point 500 feet downstream of the Atchison, Topeka and Santa Fe Railway Company bridge located over the Kansas River near river mile 21.2).

Refer to Figure A-6 on page A-22 for additional clarification on these restrictions.

B. Riverbanks.

Dredges operating close to riverbanks have a high potential to adversely impact the stability of those banks, especially when dredging occurs near the outside of sharp river bends. Bank erosion induced by such dredging can result in the loss of land, damages to manmade structures, and adverse impacts to environmental resources. Therefore, the following restrictions are being imposed to limit the potential for dredging-induced local bed degradation to adversely impact riverbank stability:

1. No dredging will be allowed within 300 feet of the ordinary high water mark elevation 1/ of any riverbank on the outside of a river bend located in a reach of river which has experienced a significant degree of lateral migration in recent years.

Those river reaches are identified as:

River miles 40.5 - 42.0
River miles 47.5 - 48.0

2. No dredging will be allowed within 200 feet of the ordinary high water mark elevation of any riverbank on the outside of a sharp river bend which has a radius of curvature of 4,000 feet or less (provided that this restriction is not precluded by 1. above).

Those bends are identified as:

River Miles
26.0 - 27.0
27.3 - 29.0
34.0 - 35.5
35.5 - 37.0
39.2 - 40.0
40.5 - 42.0
43.2 - 44.5
44.5 - 45.3
46.7 - 47.3
47.3 - 48.3
55.0 - 56.5
57.0 - 58.6
78.0 - 79.3
79.5 - 80.2
114.3 - 114.8
114.9 - 115.3
117.4 - 119.0
120.0 - 120.3

1/ Ordinary High Water Mark - Refer to part E. of this section for a definition of this term.

124.0 - 125.0
130.7 - 131.3
131.5 - 132.2
132.2 - 133.6
133.7 - 134.1
139.0 - 139.5
140.6 - 141.2
141.7 - 142.2
142.5 - 143.6
143.6 - 144.4
146.2 - 147.3
150.1 - 150.5
150.6 - 151.3
151.9 - 152.6
153.5 - 154.7
164.9 - 165.3
166.0 - 167.0
168.0 - 169.3

3. Restrictions concerning areas of the river experiencing severe bank erosion and not identified in 1. and 2. above will be considered on a case-by-case basis.

4. No dredging will be allowed within 100 feet of the ordinary high water mark elevation of any riverbank not identified in 1. and 2. above unless special authorization is granted.

NOTE: The Kansas City District can provide ordinary high water mark elevations for any location on the river.

C. Islands.

Islands 1/ provide valuable ecological diversity by creating variability in water depths and current velocities. These factors are especially important to the river's fishery, since they are requirements for a diverse fish population. Islands also provide a refuge for birds and other wildlife.

Due to the infrequency of islands in the river and due to the importance of islands for the creation of a diverse fishery and to provide a refuge for birds and other wildlife, the following restrictions are being imposed:

1. No dredging will be allowed within 100 feet of the ordinary high water mark elevation of any island. This restriction applies to all islands, including those islands that form within a permitted reach of river after initiation of dredging operations in that reach.

1/ Islands - Refer to part E. of this section for a definition of this term.

2. No clearing of vegetation will be allowed from any island in the river to facilitate commercial dredging activities.

Natural processes influence the size, shape and abundance of islands over time. Several islands have formed in the river during recent years and more may be forming. Therefore, no attempt has been made to provide a comprehensive list of islands for this Plan. Kansas City District personnel will conduct field investigations to determine the presence or absence of an island, when such determinations are necessary.

Refer to Figure A-7 on page A-23 for additional clarification on the identification of an island.

D. Tributary Mouths.

A reduction in the Kansas River's bed elevations can induce riverbed degradation in its tributaries. Lowering of bed elevations in the tributaries can result in additional adverse impacts such as bank erosion, channel widening, alteration of aquatic and terrestrial habitat, and a reduction in the structural integrity of manmade structures located in and along those tributaries. The following restriction is being imposed to limit the potential for dredging-induced localized riverbed degradation to adversely impact the Kansas River's tributaries:

No dredging will be allowed within 100 feet of a tributary mouth. The undredged zone will extend 100 feet riverward (into the Kansas River) of a straight line drawn across the tributary mouth and connected to the ordinary high water mark elevations on the Kansas River's banks on each side of the tributary.

Refer to Figure A-8 on page A-24 for additional clarification on this restriction.

E. Definition of Terms.

The following definitions are provided to clarify potentially confusing terms found in this section:

1. The term ordinary high water mark is defined for purposes of this Regulatory Plan as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas.

2. The term island is defined for purposes of this Regulatory Plan as a land form that rises from within the river channel and which meets all of the following criteria: (a) it is permanent and not shifting from location to location within the river channel (unlike a sand bar); (b) it rises to an

elevation such that it has a distinct ordinary high water mark line, or its surface elevation is greater than the ordinary high water mark elevation on the adjacent riverbank; and (c) it is a discrete land form such that an unbroken contour line can be extended 360 degrees around its perimeter at or above the elevation of the ordinary high water mark on an adjacent riverbank.

NOTE: For purposes of this Regulatory Plan, the definition of an island does not require the presence of vegetation. In addition, islands may not be surrounded by water during low river stages.

IX. Restrictions Concerning Water Quality.

A. Dredged Return Water.

Water separated from the dredged slurry and returned to the river could affect water quality parameters. Dredged return water may contain inordinately high levels of silt and/or toxic substances liberated from the dredged material during processing. In addition, the return water may pick up a high concentration of suspended solids and/or toxic substances from the plant site if it is discharged directly onto the ground and allowed to run-off into the river. Therefore, the following restrictions are being imposed to limit the potential for dredged return water to adversely impact the river's water quality:

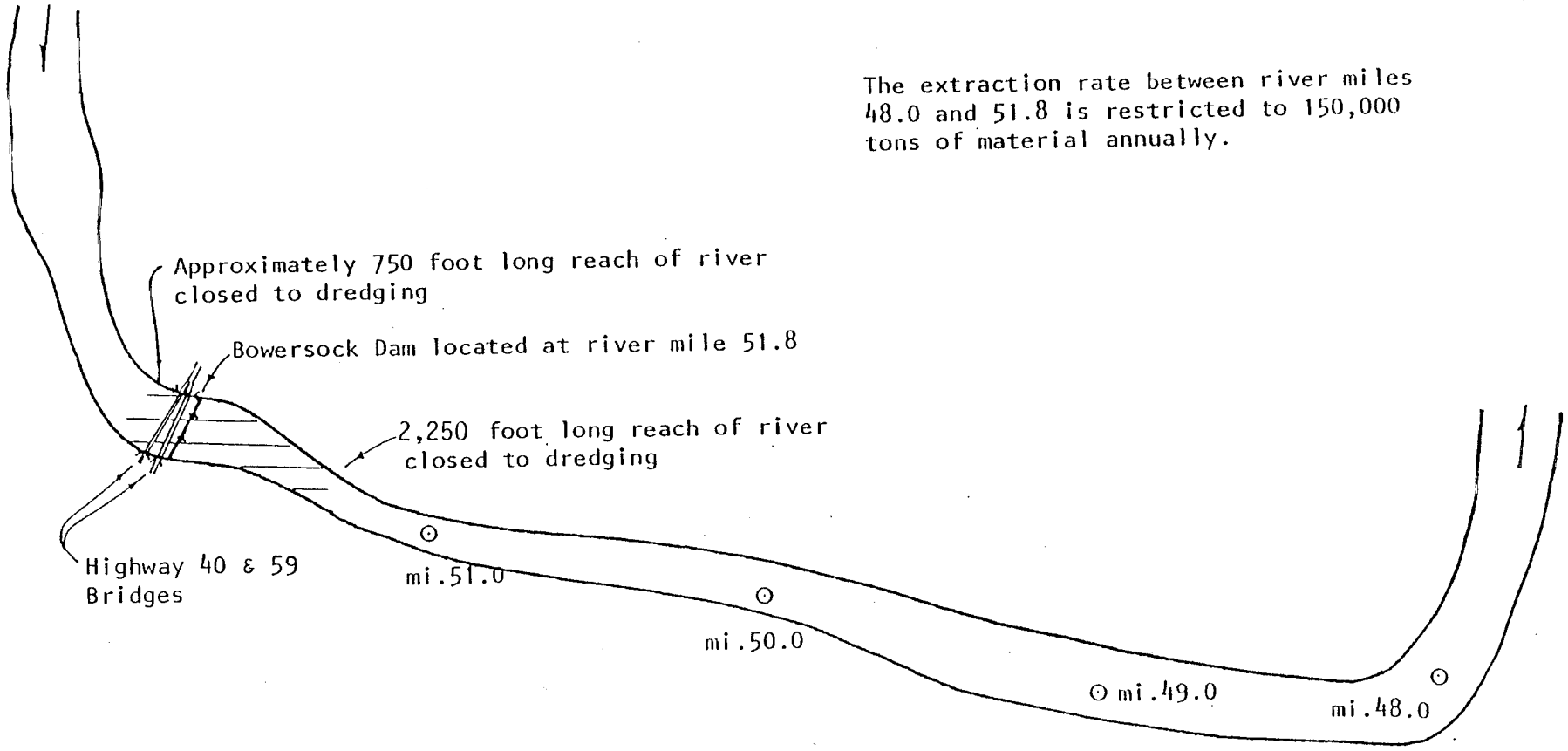
1. A requirement to pass dredged return water through a siltation basin prior to its reintroduction to the river will be considered on a case-by-case basis. If substrate conditions or other factors associated with a particular dredge location indicate that a potential water quality problem exists, the requirement for a siltation basin may be imposed.

2. Dredged return water must be conveyed from the processing facility to the river by sluiceway or by piping.

B. Dredged Silt And Miscellaneous Debris.

Silt collected in siltation basins and miscellaneous debris dredged from the river, such as wood, metal, paper and plastic cannot be returned to the water body. These waste materials must be disposed at a location and in a manner that will prevent their reintroduction to the river. This restriction will prevent dredged waste materials from adversely impacting water quality parameters in the river.

BOWERSOCK DAM



SCALE
2" = 1 mi.
APPROXIMATE

FIGURE A-1

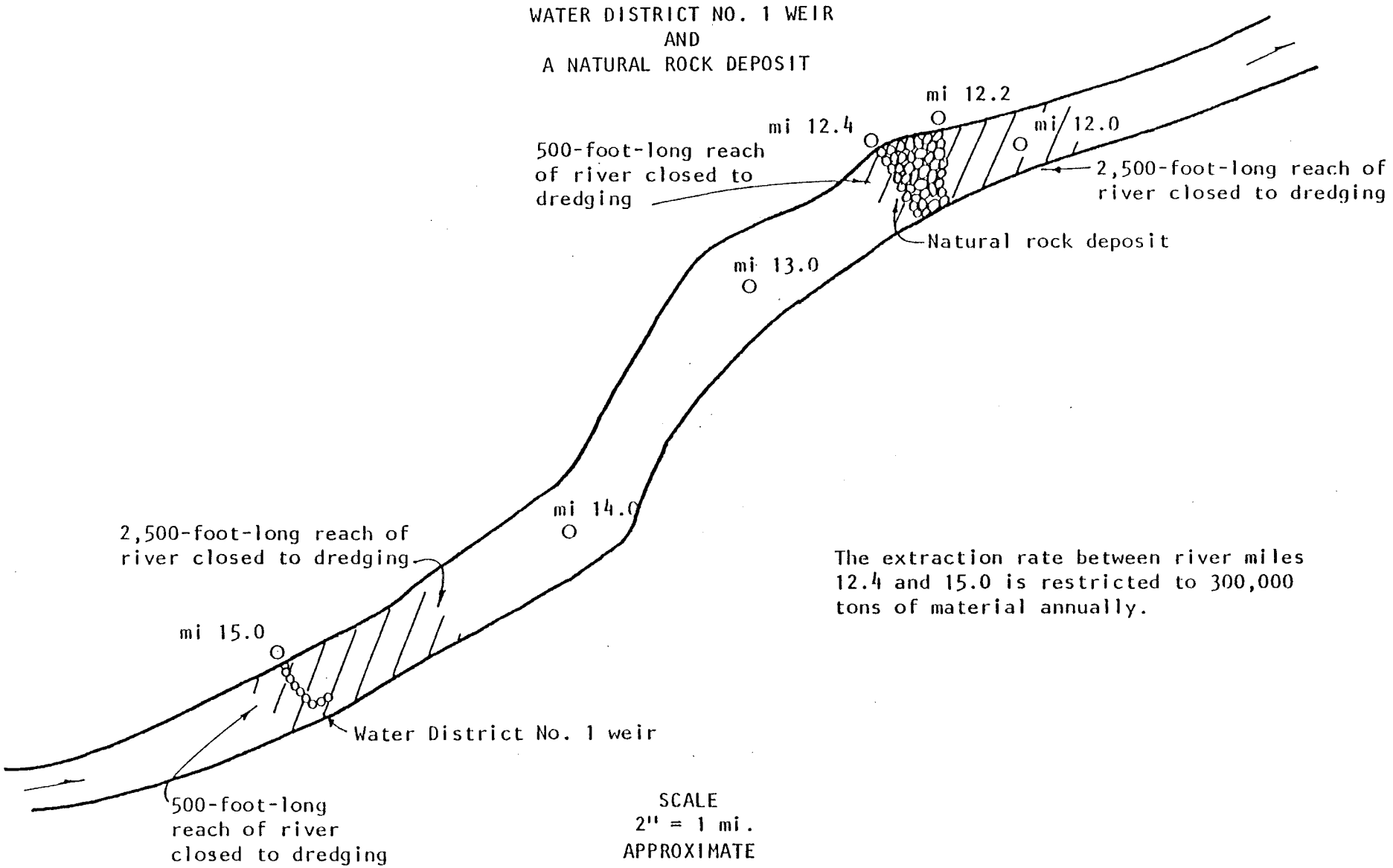
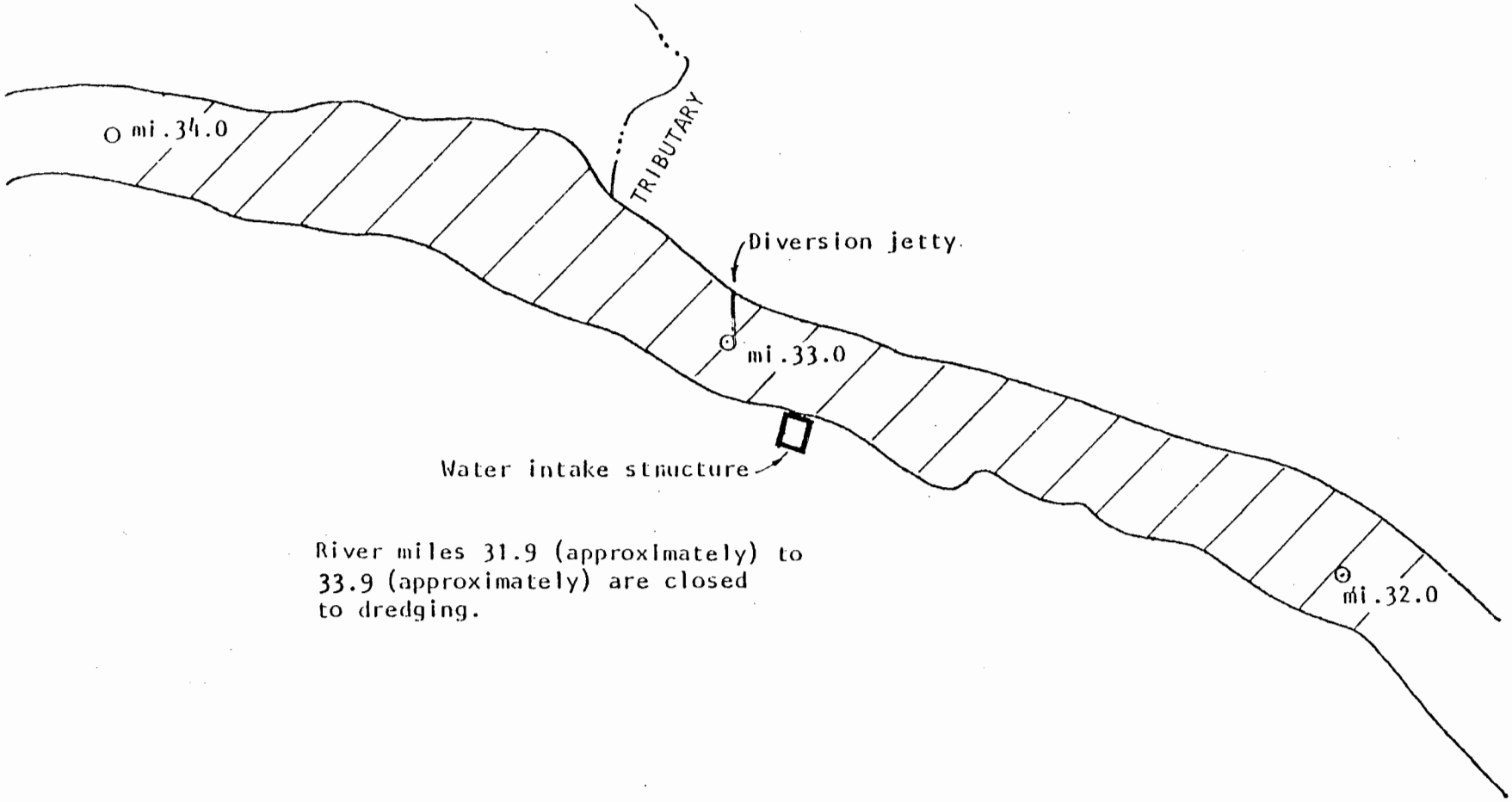

WATER DISTRICT NO. 1 WEIR
AND
A NATURAL ROCK DEPOSIT
mi 12.2
mi 12.4
mi 12.0
500-foot-long reach of river closed to dredging
2,500-foot-long reach of river closed to dredging
Natural rock deposit
mi 13.0
mi 14.0
2,500-foot-long reach of river closed to dredging
mi 15.0
Water District No. 1 weir
500-foot-long reach of river closed to dredging
SCALE
2" = 1 mi.
APPROXIMATE
The extraction rate between river miles 12.4 and 15.0 is restricted to 300,000 tons of material annually.

FIGURE A-2

SUNFLOWER ARMY AMMUNITION PLANT
WATER INTAKE STRUCTURE AND DIVERSION JETTY

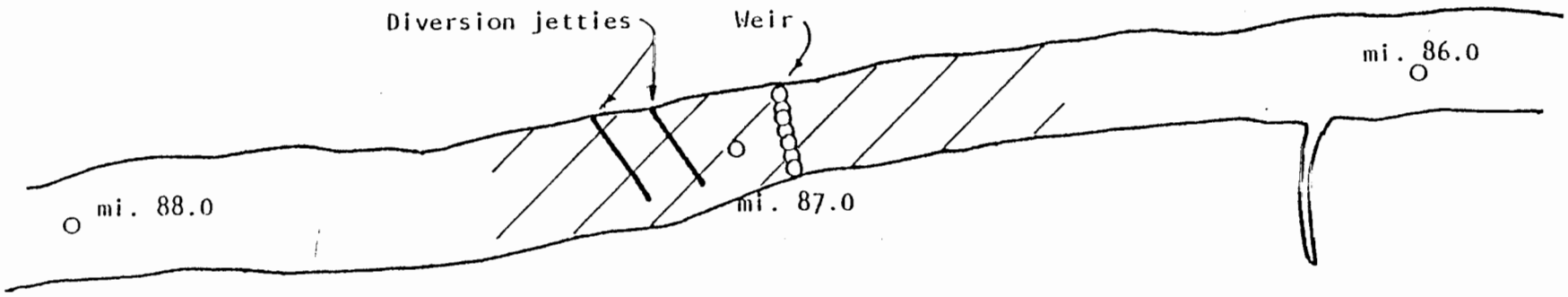


River miles 31.9 (approximately) to 33.9 (approximately) are closed to dredging.

SCALE
4" = 1 mi.
APPROXIMATE

FIGURE A-3

CITY OF TOPEKA
DIVERSION JETTIES & WEIR

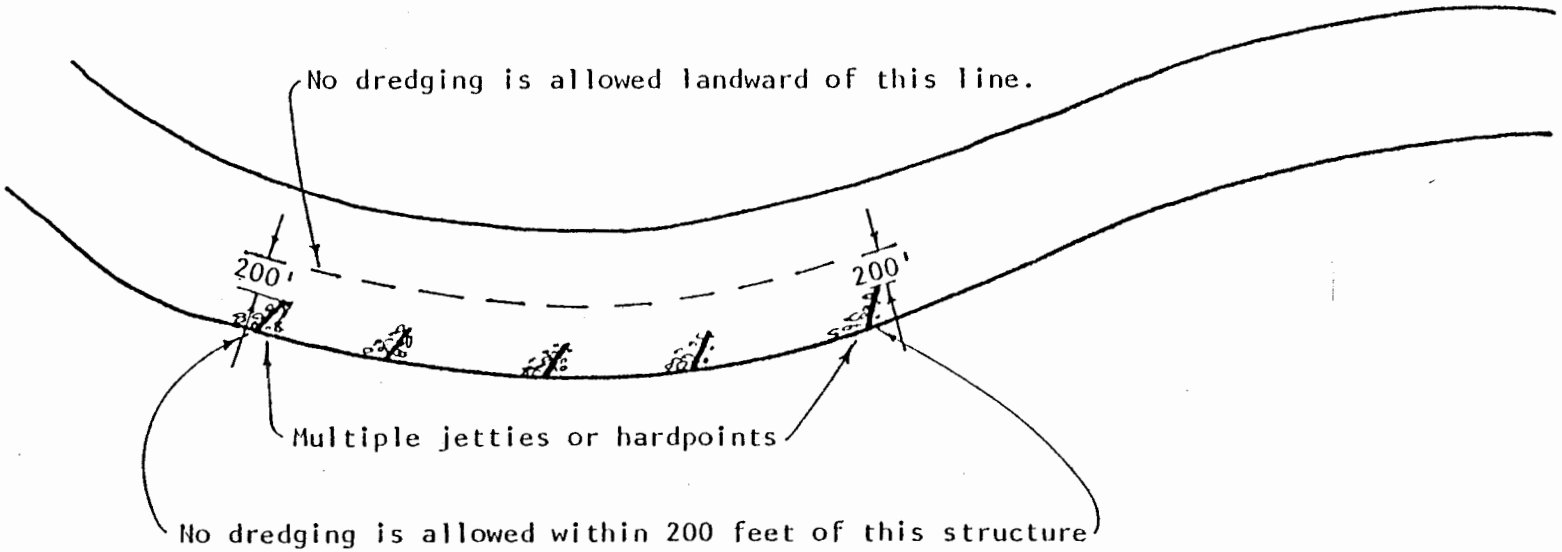


River miles 86.5 (approximately) to
87.4 (approximately) are closed to dredging.

SCALE
4" = 1 mi.
APPROXIMATE

FIGURE A-4

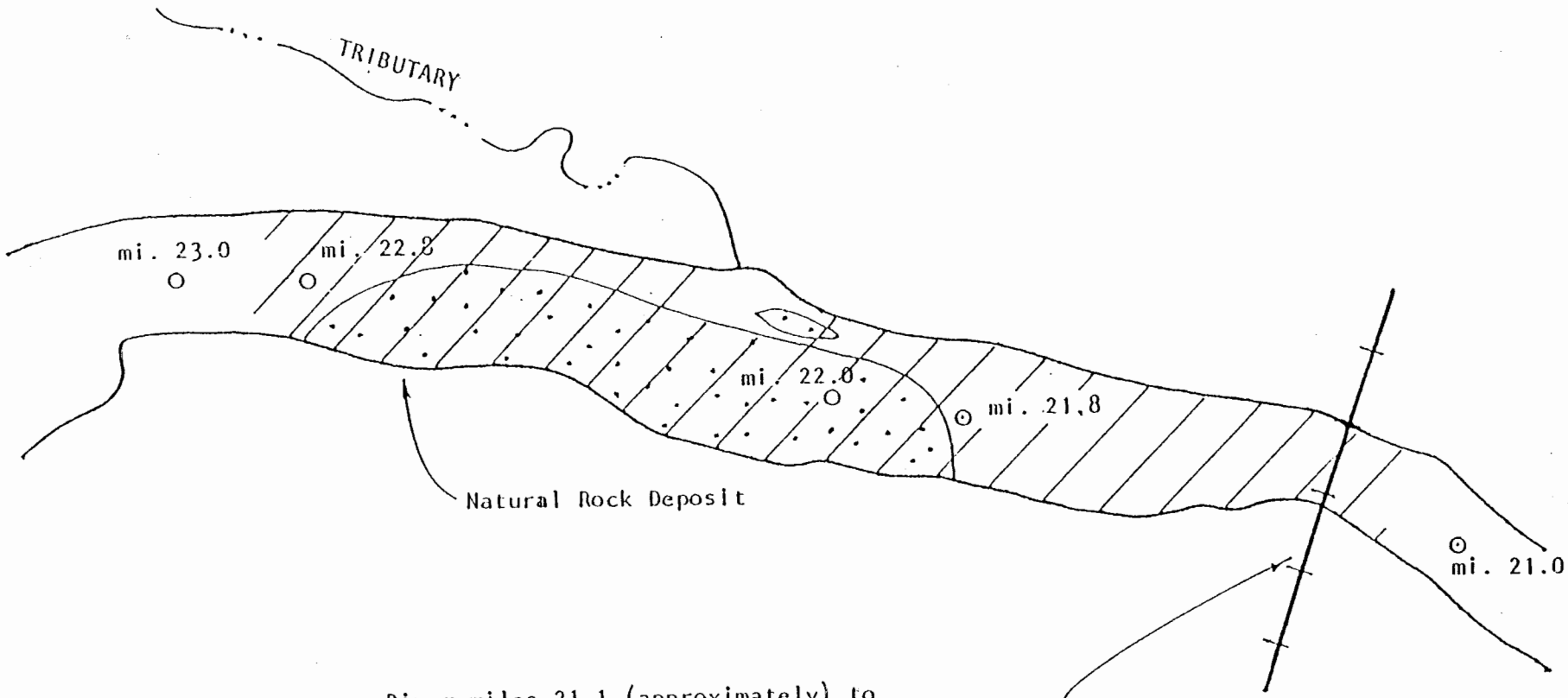
MULTIPLE BANK STABILIZATION STRUCTURES



TYPICAL PLAN VIEW

FIGURE A-5

NATURAL ROCK DEPOSIT



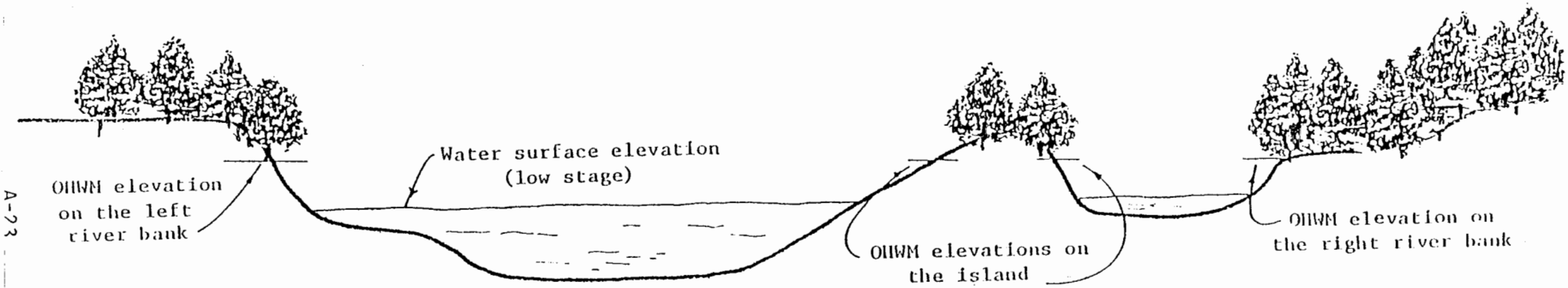
River miles 21.1 (approximately) to 22.9 (approximately) are closed to dredging.

Atchison Topeka & Santa Fe Railroad Bridge located at mi. 21.2

SCALE
4" = 1 mi.
APPROXIMATE

FIGURE A-6

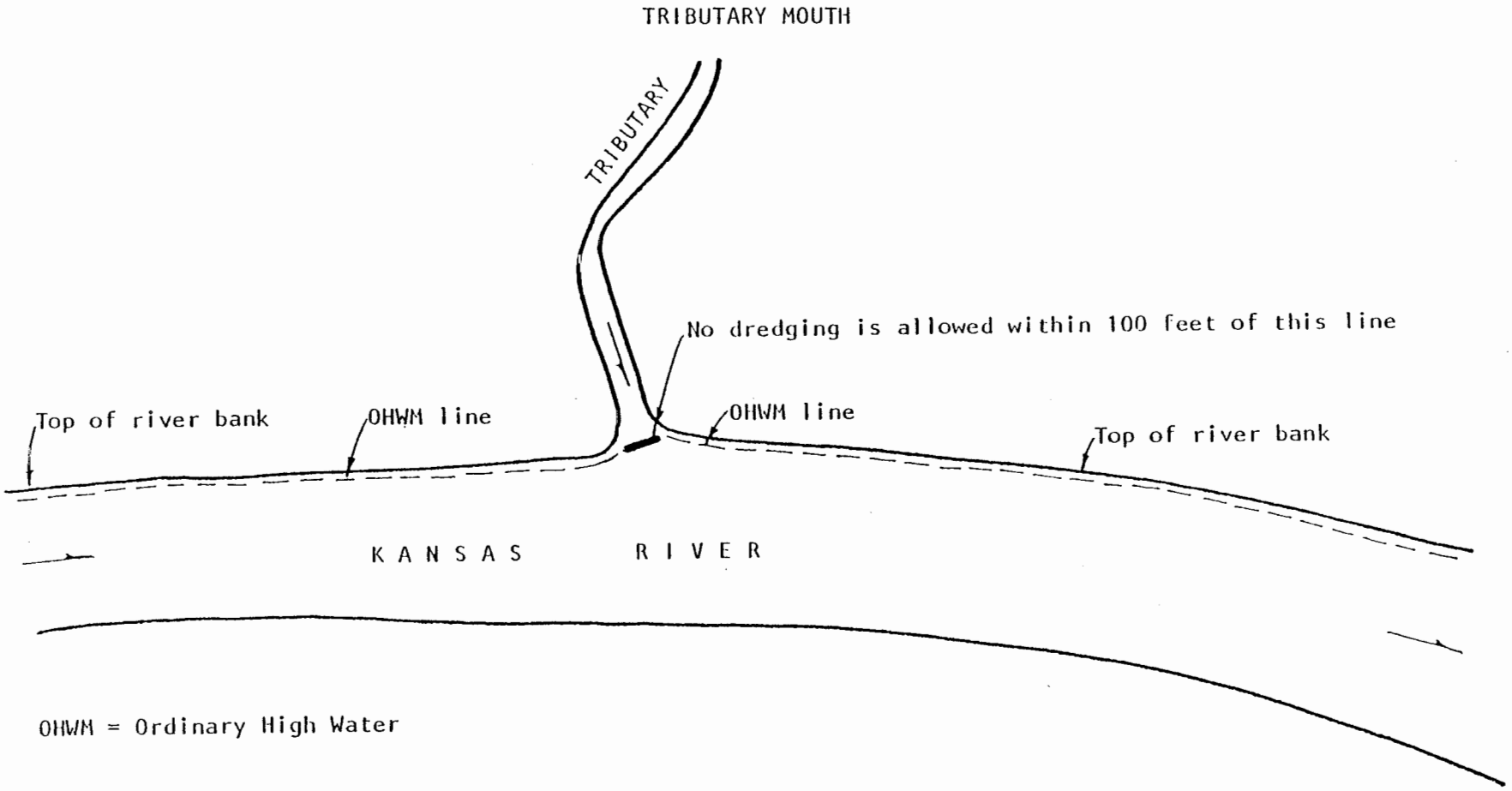
IDENTIFICATION OF AN ISLAND



OHWM = Ordinary High Water Mark

TYPICAL CROSS SECTION

FIGURE A-7



TYPICAL PLAN VIEW

FIGURE A-8

MONITORING PROGRAM

This section of the Regulatory Plan contains the criteria that have been developed to monitor the impacts of permitted dredging activities on the Kansas River. Data required to monitor dredging-related impacts must be collected by the sand and gravel producers on a routine basis and will be utilized by the Kansas City District to measure riverbed degradation and other parameters affecting the river channel's morphology. Implementation of the Monitoring Program in conjunction with the Dredging Restrictions will ensure that the established maximum acceptable level of impacts will not be exceeded.

I. General Information.

Reliable monitoring of dredging-related impacts is dependent upon the collection and utilization of various types of information. Certain data pertinent to monitoring efforts is currently available to the Kansas City District; other information which is not available to the Kansas City District must be provided to the District by the sand and gravel producers. Monumented control sites must be established at various locations along the river in order to provide some of the required information. Establishment and maintenance of the control sites is the responsibility of the producers. Information to be provided by the producers includes channel cross-section surveys, water surface elevations, aerial photography, and production figures. Field data required by the District must be accompanied by field notes containing pertinent raw data in a standard engineering format with appropriate dates, times and locations of data collections. Certain information may be requested in a preprocessed form, such as channel cross-section survey data plotted for each survey range line. In addition, requested information may be required in digital form on diskette in a format acceptable to the Kansas City District.

When a dredged reach of river is abandoned, the producers may be required to continue control site maintenance and data collections, within the abandoned reach, for a reasonable period of time. Such a requirement would depend upon the location of the abandoned reach, the impact of dredging activities on the reach and other factors pertaining to the river channel's stability within the reach. Termination of control site maintenance and data collection is at the discretion of the Kansas City District.

Contractors employed by the producers and the procedures and equipment utilized by those contractors to establish control sites and to furnish data, aerial photography and any other required information, must be approved by the Kansas City District. This document is not intended to provide all of the details concerning data collection and submittal requirements. The producers or the contractors employed by the producers must

contact the Kansas City District prior to the initiation of data collection efforts in order to assure that all data collection and submittal requirements are met.

The Monitoring Program is subject to modification by the Kansas City District at any time to ensure that the established maximum acceptable level of impacts is not being exceeded. Therefore, the sand and gravel producers are responsible for providing any additional information requested by the District to meet essential monitoring needs.

II. Control Sites.

At least one monumented control site must be established on each riverbank at the control site locations identified in Section III. A., B., and C. to provide channel cross-section survey ranges. The control sites will also be used to collect water surface elevations and to establish ground controls for aerial photography. Control sites will be established with x, y and z coordinates using approved surveying methodology.

III. Survey Ranges.

Monumented survey ranges must be established at the following locations:

A. Lower River (River Miles 0 - 51.8 (Bowersock Dam).

Monumented survey ranges will be located at approximately 1.5 mile intervals (any deviation must be approved by the Kansas City District) beginning at Turner Bridge near river mile 9.3 and ending within 1,000 feet of Bowersock Dam. In addition, a maximum of 5 monumented survey ranges will be located at 1,000 to 1,500-foot intervals through and/or adjacent to each permitted reach between Turner Bridge and Bowersock Dam. The actual number and location of ranges required in association with a permitted reach will be determined on a case-by-case basis and will depend on the length of the permitted reach and other pertinent factors. Existing monumented ranges, established by the Kansas City District, must be utilized when the locations of existing ranges coincide with required range locations. The use of existing ranges for the collection of required data will ensure continuity between historical and future data collections.

B. Topeka Area (Approximately River Miles 80 - 90).

Monumented survey ranges will be located at approximately 1.5 mile intervals (any deviation must be approved by the Kansas City District) beginning at least 5 miles below the most downstream permitted reach and ending at least 5 miles above the most upstream permitted reach. One range must be located within 500 feet of the downstream side of the Topeka water supply weir, which is located near river mile 86.9. In addition, a maximum of 5 monumented survey ranges will be

located at 1,000 to 1,500-foot intervals through and/or adjacent to each permitted reach. The actual number and location of ranges required in association with a permitted reach will be determined on a case-by-case basis and will depend on the length of the permitted reach and other pertinent factors. Existing monumented ranges, established by the Kansas City District, must be utilized when the locations of existing ranges coincide with required range locations. The use of existing ranges for the collection of required data will ensure continuity between historical and future data collections.

C. Isolated Dredging Operations.

Isolated dredging operations are permitted dredging operations that are not located within the monitored areas described in Section III. A. and B. Generally, 5 monumented survey ranges will be established to monitor each isolated dredging operation. However, the actual number of required ranges could be greater than 5 and will depend upon conditions present in the reach of river being dredged. Therefore, the number of ranges required to monitor an isolated dredge and the locations of those ranges will be developed on a case-by-case basis.

IV. Data Collection.

A. Channel Cross-Section Surveys.

A set of channel cross-section survey data consisting of at least 1 channel cross-section survey recorded along each monumented range line referenced in Section III. (Survey Ranges) must be collected as soon as possible after implementation of the Regulatory Plan, in order to provide base line data. A second set of channel cross-section data must be collected 4 years after implementation of the Regulatory Plan; and beginning 4 years after implementation of the Plan, sets of channel cross-section data must be collected at 2 year intervals (4,6,8,10,12,...). Channel cross-section surveys must be conducted during discharges of 10,000 cfs or less. Each set of channel cross-section data must be provided to the Kansas City District as soon as possible after the data has been collected.

B. Water Surface Elevations.

Two sets of water surface elevation data must be collected as soon as possible after implementation of the Regulatory Plan, in order to provide base line data. Water surface elevations must be recorded at each monumented survey range referenced in Section III. (Survey Ranges) twice during each of the data collection years specified in part A. of this section. One set of water surface elevation data must be recorded during discharges of approximately 1,500 cfs, and a second set must be recorded at discharges of approximately 5,000 cfs, during each data collection year. Water surface elevations must be collected under near steady-state conditions, such as constant

reservoir releases or near the crest of a runoff event. Each set of water surface elevation data must be provided to the Kansas City District as soon as possible after the data has been collected.

C. Sand and Gravel Production.

The total number of tons of material dredged from each permitted reach of the river must be provided to the Kansas City District semiannually. The number of tons of material extracted from each permitted reach from January 1 through June 30, and from July 1 through December 31, each year, must be provided to the District within 30 days of the close of the respective semiannual recording period.

V. Aerial Photography.

A complete set of aerial photographs must be taken of the Kansas River as soon as possible after implementation of the Regulatory Plan, in order to provide base line data. In addition, a complete set of aerial photographs must be taken of the river beginning 4 years after implementation of the Regulatory Plan and at 4-year intervals thereafter. Each set of photographs must begin at the confluence of the Kansas and Missouri Rivers and must extend to the confluence of the Kansas, Smoky Hill and Republican Rivers. Flight line coverage will have a minimum width extending from the top of the left riverbank to the top of the right riverbank and will include flagged bench marks. Flagged bench marks will consist of a standard mapping target (for a 1 inch equals 400 foot scale) located on each monumented control site. Each set of photographs will provide continuous stereographic (overlapping) coverage in color, with a scale of 1 inch equals 400 feet. Aerial photography must be performed during a discharge of 5,000 cfs or less, between late fall and late winter after deciduous trees have shed their leaves and when no snow cover exists. Each set of aerial photographs and the negatives must be provided to the Kansas City District as soon as possible after photographic work has been completed.

APPENDIX B

PUBLIC INVOLVEMENT
and
PUBLIC VIEWS AND COMMENTS

Index

Page

Scoping Meeting Public Notice B-1

Public Views and Comments (In some cases the format of the letters has been modified but each letter appears in its entirety)

1. U.S. Senate, Committee on Commerce, Science, and Transportation B-6
2. U.S. Department of Commerce, National Oceanic and Atmospheric Administration B-7
3. U.S. Department of Housing and Urban Development . . . B-9
4. U.S. Department of the Interior, Office of Environmental Project Review B-10
5. U.S. Environmental Protection Agency B-17
6. U.S. Soil Conservation Service B-20
7. Kansas House of Representatives B-21
8. Kansas State Historical Society B-22
9. Kansas Water Office B-23
10. Kansas Wildlife & Parks B-26
11. Missouri Office of Administration B-31
12. Johnson County Environmental Department B-32
13. City of Lawrence, Kansas B-33
14. Holliday Sand and Gravel Company B-34
15. Holliday Sand and Gravel Company B-37
16. Kaw Sand Company B-42
17. Kaw Sand Company B-44
18. Kaw Sand Company B-46
19. Kaw Sand Company B-47
20. Kaw Sand Company B-48
21. Kaw Sand Company B-50
22. Kaw Sand Company B-52
23. B.S.C. Holding, Inc. B-55
24. B.S.C. Holding, Inc. B-56
25. Builders Sand Co. B-63
26. Kansas Sand and Concrete, Inc. B-65
27. Penney's Concrete Co. B-69
28. Meier's Ready Mix B-70
29. Kaw Valley Sand & Gravel, Inc. B-71
30. Kansas Ready Mixed Concrete Association and Kansas Aggregate Producers Association B-74
31. The Associated General Contractors of America B-75
32. R.H. Plunkett Co. Inc. B-76
33. Jim Plunkett Inc. B-77
34. Roland Hattock B-78
35. Chamber of Commerce of Greater Kansas City B-79

Index (cont.)

		Page
36.	Water District No. 1 of Johnson County	B-81
37.	Union Pacific Railroad Company	B-83
38.	Cook, Flatt and Strobel	B-84
39.	Eulalia M. Lewis	B-86

US Army Corps
of Engineers
Kansas City District

Scoping Meeting
Concerning Issuance of Kansas River Sand and Gravel Dredging Permits

Commercial sand and gravel dredgers desiring to operate on the Kansas River in Kansas are required to secure a Department of the Army permit from the Corps of Engineers in accordance with Section 10 of the Rivers and Harbors Act of 1899. In response to various questions and concerns raised in recent years regarding the impacts commercial dredging may have on the river, the Kansas City District, Corps of Engineers (KCD) conducted several studies which address potential impacts to the morphology and ecology of the river system. It was concluded from these studies that commercial dredging has had an adverse impact on the river system and that continued dredging has a high potential to further impact the system. The Kansas River reach of particular concern is the area between Lawrence, Kansas and the confluence with the Missouri River.

The KCD has determined that a Regulatory Plan should be developed to serve as a guide in issuing or denying permits for commercial sand and gravel dredging on the Kansas River. As part of this effort, an Environmental Impact Statement (EIS) will be prepared to assess the impacts associated with the implementation of such a Regulatory Plan.

In accordance with the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act, the KCD is seeking input from the public concerning the contents of the Regulatory Plan. If you are interested in providing input to this plan, you are invited to attend a Scoping Meeting to be held at:

7:30 p.m. on Wednesday
October 9, 1985
in the Community Room
of the Commercial State Bank
309 Oak Street
Bonner Springs, Kansas

The Commercial State Bank is located one block west of the stoplight on K-32.

The Scoping Process

Council on Environmental Quality (CEQ) regulations for implementation of the National Environmental Policy Act (NEPA) require "...an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping." The purposes of scoping are:

- To identify the significant issues to be analyzed in depth in the environmental impact statement; and

- To identify and eliminate from detailed study the issues which are not significant.

The Scoping Meeting is being conducted to determine the nature and extent of the environmental issues and concerns that should be addressed in the EIS. The Scoping Meeting will allow affected federal, regional, state, and local agencies, organizations, interest groups, and the general public the opportunity to provide input into both the Regulatory Plan and EIS.

The Scoping Meeting will open with a general session that will include:

- An introduction explaining meeting procedures and the scoping process.

- An explanation of the KCD's involvement in regulating commercial sand and gravel dredging activities on the Kansas River.

- An overview of past studies undertaken by the KCD to determine the effect of commercial sand and gravel dredging activities on the Kansas River.

- A description of preliminary alternatives and the general impacts that may be associated with these alternatives.

- A briefing on the Environmental Impact Statement process, including a schedule for the draft and final EIS's, and a discussion of the major resources which will be considered.

After this presentation, there will be a 30-minute question and answer period. Following this period, a number of workshop groups may be formed so that input about specific areas of concern can be obtained.

Possible alternatives of the Regulatory Plan and their potential environmental impacts are given in the enclosed list. You are reminded, however, that the concepts provided are preliminary and incomplete. They were prepared to give you a better understanding of the purpose of the Scoping Meeting and to stimulate your participation at the meeting.

During the Scoping Meeting, it is important that you raise and discuss issues that are of concern to you. Comment sheets, like the one included here, will also be available for your use. The sheets can either be filled out at the meeting or taken home and mailed to the KCD at the address listed below. This same address is provided on the comment sheet.

The verbal and written comments received during the scoping process will be used by the KCD to identify issues which require in-depth analysis in the EIS and to eliminate those which are insignificant.

If you are unable to attend the Scoping Meeting, but wish to receive information on the progress of the study, please provide your name and address to:

Colonel Robert M. Amrine
District Engineer
U.S. Army Corps of Engineers
ATTN: PD-R
700 Federal Building
Kansas City, Missouri 64106-2896

Your participation in this process is greatly appreciated!

NAME: _____

STREET ADDRESS: _____

CITY AND STATE: _____

ZIP CODE: _____

☐ Please check here if you wish to receive a copy of the Draft EIS.

(Fold and tear along the dashed line and return to the KCD address given above.)

Comment Sheet

for Scoping Meeting Concerning Issuance of Kansas River Sand and Gravel Dredging Permits

1. What specific areas of concern do you have about sand and gravel dredging in the Kansas River?

2. What alternative or combinations of alternatives would alleviate your concern(s)? Your suggestions need not be limited to the alternatives shown in the "List of Preliminary Alternatives and Impacts."

3. In your opinion, what would be the beneficial or detrimental effects associated with the alternative or combination of alternatives you have recommended? In your response, you may want to consider the effect that your recommendation may have on existing resources, i.e., fish and wildlife, tax revenues, the local economy, the workforce, recreation, and agricultural land.

This Comment Sheet may be turned in at the Scoping Meeting or mailed, no later than October 31, 1985, to:

Colonel Robert M. Amrine
District Engineer
U.S. Army Corps of Engineers
ATTN: PD-R
700 Federal Building
Kansas City, Missouri 64106-2896

List of Preliminary Alternatives and Impacts

The preliminary alternatives listed below have been provided to assist you in the identification of your specific concerns and their related issues. This list is not intended to be all inclusive and suggested alternatives are welcome. Following the alternatives is a list of impacts that may be associated with some or all of the alternatives. Again, the impacts listed do not necessarily represent all of the impacts that may occur. Any of these alternatives could be incorporated into the Regulatory Plan. A single alternative could be used for the entire length of the Kansas River or a variety of alternatives may be combined for specific river reaches.

Alternatives

- Continue to issue dredging permits with the limited restrictions imposed in the past.
- Establish minimum allowable distances between dredges.
- Increase/decrease minimum allowable distances between dredges and structures, i.e., water intakes, bridge piers, pipelines.
- Restrict dredging to certain locations or reaches of the Kansas River.
- Restrict quantity of material to be extracted at any location or from any reach of the Kansas River.
- Restrict dredging during fish spawning season.
- Prohibit dredgers from moving into previously undredged reaches of the river.
- Allow unrestricted dredging in the Kansas River.
- Stop all dredging in the Kansas River.
- Alternate sources of dredged material, i.e., Missouri River, land mining.

Impacts

- Continued or accelerated riverbed degradation and bank erosion in areas currently experiencing such effects.
- Riverbed degradation and bank sloughing in new areas of the river.
- Higher cost of sand and gravel because of longer hauling distances between dredging operations and construction sites.
- Increased operating costs for producers.
- Increased material costs for consumers.
- Temporary or permanent shortage of certain gradations of sand and gravel.
- Fish habitat in dredge pit areas changed from river-like to lake-like habitat.
- Elimination of jobs.
- Seasonal unemployment.
- Increased rate of relocation of dredges along the river.
- Increase/decrease in tax revenues from sand and gravel royalties paid to the State of Kansas.
- Loss/gain of business and personal incomes.

ERNEST F. HOLLINGS, SOUTH CAROLINA, CHAIRMAN
DANIEL K. INOUYE, HAWAII
WENDELL H. FORD, KENTUCKY
DONALD W. RIEGLE JR., MICHIGAN
J. JAMES EXON, NEBRASKA
ALBERT GORE JR., TENNESSEE
JOHN D. ROCKEFELLER IV, WEST VIRGINIA
LLOYD BENTSEN, TEXAS
JOHN F. KERRY, MASSACHUSETTS
JOHN B. BREAUX, LOUISIANA
BROCK ADAMS, WASHINGTON
JOHN C. DANFORTH, MISSOURI
BOB PACKWOOD, OREGON
NANCY LANDON KASSEBAUM, KANSAS
LARRY PRESSLER, SOUTH DAKOTA
TED STEVENS, ALASKA
ROBERT W. KASTEN JR., WISCONSIN
PAUL S. TRIBLE JR., VIRGINIA
PETE WILSON, CALIFORNIA
JOHN MCCAIN, ARIZONA
RALPH S. EVERETT, CHIEF COUNSEL AND STAFF DIRECTOR
WALTER B. MCCORMICK, JR., MINORITY CHIEF COUNSEL AND STAFF DIRECTOR

United States Senate
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
WASHINGTON, DC 20510-6125

March 16, 1989

Colonel John H. Atkinson, District Engineer
Kansas City District
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Colonel Atkinson:

It has been brought to our attention that the U.S. Army Corps of Engineers has proposed regulations to restrict sand dredging in the Kansas River. We would like to comment on the potential impact that the proposed plan may have on the communities dependent on the Kansas River as a resource.

We recognize that regulation of sand dredging is necessary to prevent continued environmental and structural damage along the Kansas River. However, we are also aware that the resulting reduction in the supply of construction materials may have an economic impact on communities along the river.

It is our hope that the final regulatory plan will successfully prevent any environmental or structural damage along the Kansas River without undue economic hardship to nearby communities.

Thank you for your consideration of our comments.

Sincerely,

Sen. John C. Danforth

Sen. Robert Dole

Sen. Christopher S. "Kit" Bond

Sen. Nancy Landon Kassebaum

Rep. Jim Slattery

Rep. Jan Meyers

CORPS RESPONSE TO COMMENTS

1. United States Senate, Committee on Commerce, Science, and Transportation
March 16, 1989

1 Comments are noted.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

Office of the Chief Scientist

March 9, 1989

Colonel John H. Atkinson
Department of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Colonel Atkinson:

This is in reference to your Regulatory Report and Draft Environmental Impact Statement on the Commercial Dredging Activities on the Kansas River.

We hope our comments will assist you. Thank you for giving us an opportunity to review the document.

Sincerely,

David Cottingham

David Cottingham
Director
Ecology and Environmental
Conservation Office

Enclosure

CORPS RESPONSE TO COMMENTS

2. United States Department of Commerce, National Oceanic and Atmospheric Administration
March 9, 1989

No response necessary.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

MAY 3 1989

MEMORANDUM FOR: David Cottingham
Ecology and Environmental Conservation Office
Office of the Chief Scientist

FROM: Rear Admiral Wesley V. Hull, NOAA
Director, Charting and Geodetic Services

SUBJECT: DEIS 8901.12 - Commercial Dredging Activities on the Kansas River, Regulatory Report and DEIS

The subject statement has been reviewed within the areas of Charting and Geodetic Services' (C&GS) responsibility and expertise and in terms of the impact of the proposed actions on C&GS activities and projects.

A preliminary review of C&GS records has indicated that there are no geodetic control survey monuments in the proposed project area.

For further information about nearby monuments in adjacent areas, please contact the National Geodetic Information Branch, N/CG17, Rockwall Bldg., room 20, National Geodetic Survey, NOAA, Rockville, Maryland 20852, telephone 301-443-8631.

cc:
N/CG17 - Spencer
N/CG1x32 - Cohen

B-8

CORPS RESPONSE TO COMMENTS

1 Comments are noted.

U.S. Department of Housing and Urban Development
Kansas City Regional Office, Region VII
Professional Building
1103 Grand Avenue
Kansas City, Missouri 64106-2496

February 16, 1989

Department of the Army
Kansas City District
Corps of Engineers
700 Federal Building
Kansas City, MO 64106

ATTENTION: Environmental Resources Branch

Dear Sir:

SUBJECT: Draft Environmental Impact Statement (EIS) for Commercial Dredging Activities on the Kansas River (January 1989)

This office has reviewed the subject draft EIS for commercial dredging activities on the Kansas River. The document was found to be in accordance with the spirit and intent of the National Environmental Policy Act and no apparent adverse impacts were noted relating to Housing and Urban Development projects in this jurisdiction.

We appreciate the opportunity to comment.

Sincerely,

Lance L. Long
Environmental Officer
Office of Community Planning
and Development

CORPS RESPONSE TO COMMENTS

3. United States Department of Housing and Urban Development
February 16, 1989

1 Comment is noted.

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
DENVER FEDERAL CENTER, BUILDING 56, ROOM 1018
P.O. BOX 25007
DENVER, COLORADO 80225-0007

April 21, 1989

ER 89/219

Colonel John H. Atkinson
District Engineer
Kansas City District, Corps of Engineers
700 Federal Building
601 E. 12th Street
Kansas City, Missouri 64106-2896

Attn: MRKPD

Dear Colonel Atkinson:

The Department of the Interior has reviewed the Draft Regulatory Report and Environmental Impact Statement (EIS) for Commercial Dredging Activities on the Kansas River, Kansas and has the following comments.

REGULATORY REPORT

General Comments

The U.S. Fish and Wildlife Service's (FWS) letter of November 12, 1985, provided scoping comments for this EIS and Regulatory Report. In its comments, FWS recommended that the Corps conduct and submit to FWS a biological assessment, pursuant to Section 7(c) of the Endangered Species Act, to determine the effects of the proposed project on listed and proposed species. The draft Regulatory Report does not address this comment. Your final report should include the results of a biological assessment. At your request, the FWS office in Manhattan, Kansas will provide technical assistance to the Kansas City District during the development of this biological assessment.

Specific Comments

Page 20, Section VI, Problem Identification, paragraph 2:

In 1980 the National Park Service (NPS) included 57 miles of the Kansas River (from I-635 to the Delaware River) on the Nationwide Rivers Inventory. Rivers in the Inventory may qualify for inclusion in the National Wild and Scenic River System. Five values of the Kansas River were cited: scenic, recreation, fish and wildlife, and cultural. Given the river widening, degradation and slack water condition resulting from the additional sand and gravel dredging over the past nine years, it is questionable whether: (a) the

CORPS RESPONSE TO COMMENTS

4. United States Department of the Interior
Office Of Environmental Project Review
April 21, 1989

1

A biological assessment is included as Appendix D to the Final Environmental Impact Statement (EIS). This assessment has been coordinated with and approved by the U.S. Fish and Wildlife Service, Manhattan, Kansas office.

2

Upon implementation of the Regulatory Plan all current permits authorizing commercial dredging operations on the Kansas River will expire. The National Park Service office in Omaha is on the Kansas City District's public notice mailing list and will have an opportunity to comment on all future requested permits prior to a determination by the District to issue or deny those permits. It should be noted that the 57-mile reach of the Kansas River that is being considered for designation in the National Wild and Scenic River System has been classified as being eligible for recreational river status. According to the 1980 draft report prepared by the Heritage Conservation and Recreation Service, now the National Park Service, this segment "did not meet eligibility for SCENIC classification due to the extensive shoreline intrusions and to the absence of outstanding scenic values." It is the Corps position that the impacts associated with sand and gravel dredging do not significantly impact the recreational potential of the Kansas River.

values which prompted the Inventory listing have been maintained and, (b) the depiction of esthetic and recreational impacts as minor is appropriate. Given the August 2, 1979 Presidential Directive that Federal agencies include measures to avoid or mitigate adverse effects on rivers in the Inventory, the Corps should contact the NPS office in Omaha and work with them to ensure that no further degradation of the River's values occurs prior to the time that Congress makes a final decision regarding designation of this River.

Page 22, Ecological Impacts:

This section should address bed degradation and the subsequent lowering of the water table within the river alluvium as it pertains to lowered water levels within wetlands adjacent to the river. A monitoring station should be established at Silver Lake to determine if this oxbow cutoff is being dewatered as a result of bed degradation and the subsequent lowering of the ground water table. Silver Lake experienced a devastating fish kill in 1988 as a result of a depleted water supply. Such kills may become a more frequent event if degradation continues within the reach of river west of Topeka.

In addition to loss of wetlands which are located in the floodplain but are removed from the main channel of the Kansas River, this section should address the loss of wetlands within the banks of the river. A determination should be made concerning the location and present condition of vegetated sandbars within the high banks of the Kansas River. Vegetated bars are inundated or saturated frequently, support hydrophytic vegetation, and are composed of soils that are generally classified as Sarpy soils, a hydric soil designation. Vegetated bars appear to meet all of the criteria established for identifying and delineating wetlands under the jurisdiction of the United States. To allow the removal of such wetlands by dredging appears to be contrary to existing regulations, policy, and the Executive Order established for the protection of wetlands.

Page 27, Cessation of Dredging:

The alternative of removing dredges from the Kansas River has been eliminated from further consideration. We believe this decision may be premature given that the public interest review of the draft Environmental Impact Statement is incomplete. The final report should include an analysis of the cost of continuous dredging in terms of economic losses to local, regional and State facilities as compared to the economic return to the dredge industry and those they serve.

CORPS RESPONSE TO COMMENTS

3

The section concerning ecological impacts in the final Regulatory Report has been changed to address the potential for riverbed degradation to adversely impact wetlands in the Kansas River floodplain. The establishment of a monitoring station on Silver Lake is not warranted at this time. There is no indication that dredging activities in the Topeka area (approximately river miles 80-90) have affected water surface elevations in Silver Lake (approximately river mile 96). The year 1988 was one of the driest years on record in Kansas. The low water levels in Silver Lake in 1988 and the resulting fish kill are probably related to the reduced inflow into the lake from its water shed and to lowered water table elevations in the floodplain due to a significantly reduced recharge. Monitoring will be conducted in the reach of river passing through Topeka and in the reaches of river immediately upstream and downstream of the city. If monitoring efforts reveal that a head cut is proceeding upstream from the Topeka area or if dredging activities create other impacts which may adversely affect water levels in Silver Lake consideration could be given to a detailed examination of the effects of dredging on the lake.

4

The Regulatory Report will not address the potential for commercial dredging activities to destroy wetlands within the Kansas River channel. The Kansas City District is not aware of any permanent wetlands growing on sandbars within the Kansas River channel nor is the District aware of any Sarpy soils located within the channel. Sarpy soils are found in the Kansas River floodplain; however, it is unlikely that such soils would be found within the river channel. The Sarpy soils series consists of deep soils (as much as 5 feet in thickness) which are excessively drained and are generally found at least 5 feet above the water table. The Kansas River channel is typically braided upstream of the Kansas City metropolitan area during the low flow season. Wetland vegetation may sporadically invade some sand bars during low flows; however, since most sand bars in the river are unstable (relatively fluid), vegetation which may have become established during low flows is normally dislodged during the next high water event.

5

The alternative of removing dredges from the Kansas River has only been eliminated from further consideration for purposes of preparing this draft report. This decision, and others, will always be subject to change based on the availability of information necessary to justify them. A formal economic analysis was not conducted for the proposed action due to the many economic complexities involved in the dredging issue including assessing the "economic return to the dredge industry and those they serve." The proposed Regulatory Plan was based on the significant, adverse impacts that have been documented as occurring to non-dredging interests located along the Kansas River and the fact that alternative sources of sand and gravel do exist in the area of concern and these do have only minimal, if any, adverse impacts to non-dredging interests associated with them.

Page 32, Restrictions Concerning Natural Formations:

As indicated in the FWS's November 12, 1985, scoping comments, a ten-mile reach of the Kansas River (river miles 56 to 66) is a high use area for wintering bald eagles. This area should receive special consideration as an exclusion area for sand and gravel dredging activities. For example, easements on riparian timber have been granted downstream of Bowersock Dam to preserve perches for wintering bald eagles.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

General Comments

The draft EIS (DEIS) lacks adequate information (e.g., site specific locations, design measures to minimize harm, and extent of shore based facilities) for a full understanding of how individual dredge and fill permits from the Corps of Engineers may affect fish and wildlife resources.

As previously mentioned, FWS's November 12, 1985, letter from David Bowman to Colonel Amrine stated that Section 7(c) of the Endangered Species Act requires that a biological assessment be prepared for this project. If your agency determines there will be no affect, that decision needs to be documented and submitted to FWS for concurrence. Furthermore, FWS's scoping comments noted that such an assessment should be prepared in compliance with Section 102 of the National Environmental Policy Act (NEPA) (40 CFR 1502.25).

For purposes of this EIS, the biological assessment should include consideration of impacts on the habitats of the species, such as the bald eagle. Impacts which must be addressed include degradation or loss of mature riparian timber used by wintering eagles, as well as the effects which dredging activities might have by frightening birds from the area. Such harassment or disturbance of wintering eagles may constitute "taking" under the Endangered Species Act or the Bald Eagle Protection Act. Provisions to avoid this concern should be included in the final EIS (FEIS). The FEIS also should address means of conserving species, such as the pallid sturgeon, that are candidates for Federal listing.

When a biological assessment is prepared, and if it indicates that a listed species may be affected, the Corps should enter into formal Section 7 consultation with FWS. In that case, we recommend the FEIS be deferred until that consultation process is completed. As mentioned previously, FWS is prepared to assist the Corps in meeting their responsibilities under the Endangered Species Act. Therefore, FWS's Nebraska State Supervisor for Fish and Wildlife Enhancement will again contact your District Engineer's Office in an effort to resolve this matter.

Specific Comments

Page 6, Unresolved Issues:

Features to offset damages to fish, wildlife, their uses, and the naturally functioning Kansas River ecosystem have been incorporated into interim permit conditions. However, as dredging operations take place, these features may not be adequate to protect islands, tributary mouths, high bank woodlands, and instream natural features. If monitoring programs document changes in natural formations with a regulatory program in place, FWS will recommend appropriate compensation of damages to fish and wildlife, their habitat, and their human uses. FWS requests the opportunity to carefully review the results of any monitoring program. If not satisfied that protective measures adequately protect natural features, FWS will recommend additional measures.

6 Upon implementation of the Regulatory Plan all current permits authorizing commercial dredging operations on the Kansas River will expire. The U.S. Fish and Wildlife Service is on the Kansas City District's public notice mailing list and will have an opportunity to comment on all future requested permits prior to a determination by the District to issue or deny those permits. This procedure will assure that potential dredging related impacts to wintering bald eagles will be evaluated on a case by case, site specific basis.

7 A biological assessment has been coordinated with and approved by the U. S. Fish and Wildlife Service, Manhattan, Kansas office and is attached as Appendix D.

8 The Kansas City District will make monitoring data available to all interested parties upon request.

Colonel John H. Atkinson 4

Pages 7 and 59, Endangered Species Act:

This section indicates that general impacts to threatened and endangered species have been determined, but site specific impacts will only be identified as individual permits are applied for by dredging interests. If dredging interests apply for any permit and the programmatic and cumulative impacts of dredging operations are still unresolved, a "may affect" situation could result for each permit, thus requiring formal consultation under the Endangered Species Act for each permit. This same problem ("impacts cannot be identified at this time") is repeated on pages 59 through 61. Now is the time to coordinate and arrive at solutions to threatened and endangered species concerns. The Corps must evaluate whether a "may affect" situation exists for the overall dredging program it regulates. Piecemealing is inappropriate under NEPA and the Endangered Species Act. If problems are encountered with individual permits at a later date, many formal consultations could result.

Page 7, Executive Order 11990:

The protective provisions of Executive Order 11990 should be applied to all vegetated sandbars which meet the wetland criteria.

Page 15, Endangered Species:

The matrix should address the impact of each alternative to each species of concern. Impacts to bald eagle roost and perch sites are of special interest.

Page 33, Threatened and Endangered Species:

Please add the following to Paragraph 1 of this section in the FEIS: "The U.S. Fish and Wildlife Service received a petition in June 1988 to initiate listing actions for the pallid sturgeon. A proposal to federally list this species as either threatened or endangered is expected to be published in the Federal Register no later than June 16, 1989. Final listing will then likely occur within the following 12 months." Pallid sturgeon are documented in the Kansas River from no further west than Douglas County (i.e., City of Lawrence).

Page 40, Sand and Gravel Sale Price:

Although the DEIS gives percentage cost increases for the sale price per ton of aggregate for each alternative, we suggest that the market impact discussion could be improved by translating these figures into the average increase in the cost of construction of a road or new home. The percentage increases determined for each alternative (p. EIS-40) could be combined with the Booker Associates' figures for percentages of road asphalt and home construction cost caused by aggregate requirements (p. EIS-24) to derive a more easily understood consumer impact. The present average home construction costs for metropolitan areas should be compared with the costs anticipated for each alternative.

CORPS RESPONSE TO COMMENTS

9 The Corps does not see how "solutions to threatened and endangered species concerns" can be arrived at without knowing if there is a problem. This will not be known until the Regulatory Plan is implemented and KCD knows how many dredgers will apply for permits on the Kansas River, the proposed locations of the dredging operations, and quantities of material they wish to remove. Potential impacts to endangered species, if any, will be addressed in the processing of each specific permit application. Each permit application will undergo public review and must comply with the requirements of the Endangered Species Act. For any permit application which may have the potential to impact endangered species, a biological assessment for that specific permit application will be required and, if necessary, formal consultation will be undertaken.

10 Refer to comment 4. of this letter.

11 No significant impacts to any endangered species have been identified. Therefore, no species are included in Table EIS-1.

12 Information on the pallid sturgeon has been added to the Final EIS. The proposal was published in the Federal Register on August 30, 1989.

13 Concur. Appropriate revisions have been made to the Final EIS.

Likewise, road construction costs could be put in better perspective by comparing the present annual total costs for such construction in the Kansas City area with the annual costs predicted for each alternative. We also believe that the discussion of the preferred alternative could be improved if the FEIS supplied more information regarding the two economic impact studies that examined the proposed restrictions on the dredging industry (the Burns and McDonnell study and the Daicoff study).

14

At a minimum, we recommend that their methodology be summarized and their conclusions appear in the discussion of the market effects of the preferred alternative. Unless the studies are lengthy, we also suggest they be included as appendices. It may be of value to include the Booker Associates study in an appendix as well. We believe that the inclusion of the results of such studies would clarify the nature of the market impacts anticipated for nearby metropolitan areas if the preferred alternative is implemented.

Page 41, Restricted Dredging:

Our understanding of this alternative is that the regulatory program will be implemented immediately in the upper reaches of the river upon completion of the FEIS. However, the program would be phased in within the lower reach of the river. We see no need for a phase in period for regulating dredges within a previously unaltered reach of river. Therefore, we request that the proposal be amended to require immediate implementation of the regulatory program in the unaltered lower reaches.

15

For the dredging restrictions alternative, the DEIS states that the expected percentage cost increase would fall between the estimated cost increases estimated for the no action and cessation of dredging alternatives. Although we agree with the discussion in the document that it is difficult to predict the reactions of current dredgers if restrictions are implemented, it is interesting that the only alternative for which costs cannot be reliably estimated is the preferred alternative. An economic impact study is alluded to in EPA correspondence (the Burns and McDonnell study, p. C-5) as having determined that selection of the preferred alternative would have a major economic impact on the Kansas City area construction industry. The specific conclusions of the study should be discussed for the preferred alternative in the FEIS.

16

CORPS RESPONSE TO COMMENTS

The "present annual total costs" for road construction in the Kansas City area is not readily available. Due to the minor magnitude of any increase in the delivered price of sand, relative to the price as the dredgers move farther upstream, no further example of this minor impact is needed than the house construction example already included in the Final EIS. Because of the vast quantity of technical information that has been generated during this study it would be too costly to provide complete technical reports for each reviewer. Therefore, these lengthy technical reports were provided to select libraries located throughout the Kansas River basin and made available for use by any reviewer during the comment period. Pertinent information from these technical studies are included, by reference, in the EIS.

Concur. The Regulatory Plan will be implemented on or near January 1, 1990. The Plan will be implemented with no phase-in period for dredging operations in previously undredged reaches of the river, including the newly opened reach of river upstream of Bonner Springs. The Plan will be phased-in over a three year period for existing dredging operations located in previously dredged reaches of the river, except for the newly opened reach of river upstream of Bonner Springs.

Due to the relatively small difference in the predicted average delivered price of sand for the two most extreme alternatives ("No Action" and "Cessation", see Table EIS-9), the Corps did not feel a highly speculative prediction for the selected alternative would be of any use. The reaction of the dredgers to the most extreme alternatives is more easily predicted then their reaction to the more complex, selected alternative. The EPA correspondence states that "Burns & McDonnell (1982) concluded that restricting sand and gravel dredging in the Kansas River would have major economic impact to the Kansas City area construction industry." This statement does not refer entirely to the "preferred alternative" as the 1982 Burns & McDonnell study also had additional, separate alternatives of "alternative stream sources" and "land mining." The Burns & McDonnell study concluded that these alternatives would have, respectively, substantial short-term impacts until industry stabilizes" and "moderate short-term impacts caused by changing industry." The Corps is anticipating that these "short-term impacts" would be minimized as a result of the length of time that has been needed in developing the regulatory plan along with the three year phase-in period included in initiating the plan.

In addition, the conclusions and recommendations of another economic impact study prepared by Daicoff for the Kansas River Aggregate Association (cited on p. 2 of the draft regulatory report) should be addressed in the FEIS. Finally, although it appears that sufficient sand and gravel resources occur in the affected area to supply state's needs for aggregate, it is not clearly stated whether new deposits would be easily accessible to the dredging industry. Public resistance to the siting of a new mining operation in what is perceived as "their backyard" is often quite strong. Even though a transition period has been incorporated into the regulatory plan, whether present operations can realistically relocate to other areas and what real costs they would incur during the relocation should be evaluated.

Page 41, 3. River Morphology, No Action:

The "No Action" alternative could become a reality for the lower river. The Simons, Li, and Associates model made a prediction (dredging rate D) through 1995. With a phase in period of 3 to 5 years in the lower river, it may be 1994 before any regulatory plan is in effect in the lower river reach. Therefore, the "No Action" alternative will have become a reality for the lower river; the FEIS should recognize that likelihood.

Page 44, paragraph 1:

We understand that a headcut was observed by Simons, Li, and Associates at approximately river miles 22 through 23 in 1985. Progression of the headcut was not expected to exceed one mile per year. Since the headcut will move progressively upstream, both deepening and widening of the streambed will result until a control structure (Bowersock Dam) is reached. We also understand that tributaries will respond to the lowered streambed of the Kansas River and that headcuts may develop on them as well. While resource agencies and regulatory agencies consider alternatives to current sand and gravel operations on the Kansas River, some corrective actions may already be too late. The headcut is already in progress. The severity of the cut and how to control or impede its progress may be a more appropriate subject for discussion and action. We request a more thorough discussion of this headcut phenomenon since it may be exacerbated by either the No Action or Restricted Dredging alternatives.

Page 55, 7. Land Use, No Action:

This section should address the change in land use and resultant impacts brought about by river widening. The river is 150 feet wider in the lower reach, and agricultural lands and wildlife habitat have been lost to the expanded channel.

CORPS RESPONSE TO COMMENTS

17 Conclusions and recommendations from the economic study prepared by Dr. Daicoff for the Kansas River Aggregate Association, in 1978, were not addressed in the EIS due to the age of the study and the lack of substantiated conclusions and recommendations. A more up-to-date economic study was prepared for the Corps by Booker Associates in 1986. This report contains detailed economic information provided by the dredgers for the existing baseline and a comparison of the alternatives. Relevant information from this study is included in the EIS by reference. The question of ease of accessibility to new sand deposits is difficult to address. It is known that some areas will be easier to gain access to than others. However, due to the vast size of the area involved, this concern could not be fully addressed. The Corps is aware of several dredge operators that have already bought land for pit operations and others that are already setting up operations on the Missouri River.

18 The "No Action" alternative is not expected to become a reality for the lower river (R.M. 0 to 51.8). The Kansas City District intends to implement the Regulatory Plan in early 1990. Therefore all reaches of the river would be subject to some level of restrictions early in 1990. Previously undredged reaches of the river and certain currently dredged reaches of the river would be subject to all of the restrictions incorporated into the Plan immediately upon its implementation. Historically dredged reaches of the river would be subject to an increasing level of restrictions beginning with implementation of the Plan and ending three years later. Assuming implementation of the Regulatory Plan in early 1990, the Plan would be fully implemented early in 1993.

19 As stated in the "Analysis of Channel Degradation and Bank Erosion in the Lower Kansas River" (Simons, Li, and Associates, 1984): "The net impact associated with the present headcut is small. The headcut is actually just the transition region from the unimpacted river to the highly impacted dredging area." As discussed in the Simons, Li, and Associates' report, upstream movement of the headcut reduces the slope of the headcut and its impact becomes less and less noticeable. Impacts associated with this headcut are already included in the Final EIS and, therefore, no further discussion is needed. It should be noted that the restrictions included in the Regulatory Plan should significantly minimize the adverse effects of dredging including any potential headcutting action.

20 Concur. This information has been added to the Final EIS.

Pages 58 and 59, Cessation of Dredging:

This alternative would conserve the remaining natural features of the Kansas River. Sand bars, rubble bars, islands, wetland and riparian habitat would be protected from further degradation due to sand and gravel operations. These positive aspects/impacts need to be thoroughly discussed within this section.

21

Comment is noted. Additional information has been added the Final EIS.

Summary Comments

Due to the lack of specificity in the DEIS, our comments do not preclude separate evaluation and comments by the Department of the Interior when reviewing individual permit applications. We may concur with permit issuance (with or without stipulations) or recommend denial, depending on effects. FWS's tentative position, based on available information, is to request Endangered Species Act Section 7 consultation for all requested permits within areas of the Kansas River frequented by bald eagles. Consultation and coordination with NPS regarding implications to the values of the Kansas River, as identified in the Nationwide Rivers Inventory, should also occur, both for the FEIS and for individual project applications.

22

Comment is noted. U.S. Fish and Wildlife Service input to the Public Interest Review for individual permits is welcomed.

When an appropriate biological assessment is available, FWS will be pleased to coordinate with the Corps of Engineers to preclude delay and to ensure that stipulations or conditions are concise, effective, and included in the FEIS. Specific guidance and policy regarding preparation of a biological assessment may be found in the enclosed 50 CFR Part 402.

23

A biological assessment has been coordinated with and approved by the U.S. Fish and Wildlife Service, Manhattan, Kansas office and is attached as Appendix D.

Sincerely,

Robert F. Stewart

Robert F. Stewart
Regional Environmental Officer

Enclosure

CORPS RESPONSE TO COMMENTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

MAR 9 1989

OFFICE OF
THE REGIONAL ADMINISTRATOR

Colonel John H. Atkinson, USA
District Engineer
U.S. Army Engineer District, Kansas City
700 Federal Building
Kansas City, Missouri 64106-2869

Dear Colonel Atkinson:

RE: Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River.

In accordance with the Environmental Protection Agency's (EPA) responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act, the staff of EPA Region VII reviewed the draft Environmental Impact Statement (DEIS) for the referenced project.

Based on our review of the DEIS and related documents, we support your selection of the Restricted Dredging alternative, and rate the DEIS EC-2. Although we support the preferred alternative, we emphasize our concern about the adverse environmental impacts that continued commercial sand and gravel dredging will have on the morphology and ecology of the Kansas River. The rating is contingent on the Corps of Engineers (COE) addressing the following concerns in the final Environmental Impact Statement (FEIS) and the Record of Decision. Our general concerns about the proposed Restricted Dredging alternative in the DEIS are highlighted below with detailed comments enclosed for your consideration.

1. **Restricted Dredging Alternative**

- There will be no reduction in the stringency of any of the restrictions stated in this alternative. We are particularly concerned that the limit of an average of 2 feet of riverbed degradation through any 5-mile-long reach of river remain unchanged.

- In the event you believe changes are warranted, the EPA requests that we be notified and have an opportunity to comment and coordinate with your office on the proposed changes to the restrictions outlined in the Regulatory Plan prior to their implementation.

CORPS RESPONSE TO COMMENTS

5. United States Environmental Protection Agency
March 9, 1989

1 Comment is noted.

2 Comment is noted.

3 Comment is noted. This restriction has not been changed.

4 Comment is noted. Changes to some restrictions in the FEIS have been discussed and coordinated with EPA.

2. **Effectiveness of the Monitoring Program**

- EPA recognizes that the Restricted Dredging alternative cannot be successful unless the Monitoring Program is properly implemented and maintained. We support the Program as stated with the following stipulations:

  - We request that the Monitoring Program be implemented as close to the initiation of the new dredging restrictions as possible (one year or less).

  - We recommend that an interagency evaluation of the results of the Monitoring Program be conducted five years after its inception.

3. **Phase-in Period of Restricted Dredging Alternative**

- While EPA recognizes that imposing restrictions on dredging operations may have an adverse impact on the dredging industry in the form of lost revenues, in our opinion, the overriding concerns of present and future environmental damage warrant that the restrictions be phased-in within three years or less.

In addition, we are concerned that the Restricted Dredging alternative emphasizes the protection of nondredging interests and the river's morphology more than the protection of the aquatic biota of the river. As a matter of public record in the Restricted Dredging alternative section of the FEIS, we recommend that you clarify and separately discuss in detail the impacts of dredging on aquatic ecosystem (fishery/benthos) in the upper versus lower reaches of the Kansas River (page EIS-58). We also recommend rewording the Cessation of Dredging section to more accurately reflect the condition of the riverbed without dredging (i.e., delete the comments concerning Type 1 conditions). Finally, we recommend that you clarify and discuss in what manner your comments relating to a "polluted environment" apply to the benthic fauna in particular and the dredging issue in general (page EIS-32).

CORPS RESPONSE TO COMMENTS

5 The Monitoring Program will be initiated upon the signing of the Record of Decision which is anticipated to be in early January 1990. However, data collection is dependent upon river stage and no assurance can be given that all base line data will be collected within one year of implementation of the Plan.

6 Monitoring data will be made available to interested parties upon request. In addition, the Kansas City District is willing to meet with an interagency group at any interval deemed appropriate by the group.

7 Concur. The documents have been changed to reflect the three year phase-in period.

8 Comments are noted. The Restricted Dredging alternative emphasizes the protection of nondredging interests and the river's morphology more than the protection of the aquatic biota due to the fact that impacts associated with dredging occur on a relatively small reach(s) of the Kansas River. These areas are however, where the vast majority of the nondredging interests (bridges, pipelines, etc.) are located at. Potential impacts, including catastrophic failure, to these nondredging interests are of a significantly greater magnitude then potential impacts to the aquatic biota. It should be noted that the impacts of dredging on the aquatic ecosystem, in both the upper and lower Kansas River, are basically limited to the immediate area of the dredge pits. Even through the Fishery-Dredging Study by Cross et. al. (1982) was conducted on the extreme lower Kansas River, results from the study are assumed to be basically comparable for all dredged reaches in both the upper and lower Kansas River. The largest part of the Kansas River aquatic ecosystem is not affected by dredging and is not expected to be affected anytime in the foreseeable future. Wording has been added to the FEIS to clarify these points. The Cessation of Dredging section in the FEIS has been changed in response to the comments provided. However, the comment concerning Type 1 conditions has not been deleted since this is an accurate statement. The potential for Type 1 conditions would be lost under the Cessation of Dredging

3

We assure you that this Agency will work with your staff in resolving our concerns in a timely manner. Thank you for the opportunity to review and comment on this proposed action. Ms. Cathy Tortorici of our staff will continue to coordinate EPA's involvement in this project. Please contact her at 913/236-2823 for further information.

Sincerely yours,

Morris Kay
Regional Administrator

CORPS RESPONSE TO COMMENTS

8

alternative. The comments relating to a "polluted environment" on page EIS-32 of the Draft EIS refer to the fact that field collections from previous studies on the lower Kansas River have been dominated by pollution tolerant benthic organisms. The main source of this pollution is not the dredging industry but is instead from the increased urbanization and heavy industrialization that has occurred along the lower Kansas River. This industrialization has been in the form of slaughterhouses, rendering and meat-packing plants, dairies, canneries, oil refineries, soap and paper manufacturing, and others. More recent studies do indicate that this condition may be improving with recent regulations. The discussion on this page is only for background information on the "Affected Environment" concerning the dredging issue since the benthic fauna are an important component of the aquatic ecosystem. A discussion of water quality and its relation to the dredging issue is included in both the Draft and Final EIS in Chapters 4.5 and 5.5.

United States Department of Agriculture
Soil Conservation Service
760 South Broadway
Salina, Kansas
67401

March 23, 1989

Colonel John H. Atkinson
District Engineer
Kansas City District
Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Colonel Atkinson:

The following comments are offered regarding your "Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River."

We received the extension notice for the comment period but we have misplaced our copy of the draft document. Dredging sand and gravel from the Kansas River can cause encroachment on prime farmland and riparian habitat. We understand the document's purpose is to limit such encroachment and we agree with that action. **1**

Please provide us a copy of the final document when it is available. **2**

Sincerely,

ACTING FOR
James N. Habiger
State Conservationist

1 Comment is noted.

2 Comment is noted.

HOUSE RESOLUTION No. 6096

A RESOLUTION urging the United States Army Corps of Engineers to consider the economic impact that reduced sand dredging in the Kansas River will have on construction costs in the State of Kansas.

WHEREAS, The United States Army Corps of Engineers has prepared an environmental impact statement and a draft regulatory report and plan concerning sand dredging in the Kansas River; and

WHEREAS, These reports propose that dredging be severely curtailed on the Kansas River; and

WHEREAS, The Corps of Engineers' reason for this curtailment is that dredging is the primary cause of bed degradation and channel widening on the Kansas River; and

WHEREAS, Other studies contradict the Corps of Engineers' position and indicate that there are benefits associated with dredging, and

WHEREAS, The Corps of Engineers' proposed extraction limits are not supported by empirical evidence; and

WHEREAS, The net result of these new regulations will be that the construction costs in the State of Kansas will be greatly increased; and

WHEREAS, According to the environmental impact statement filed by the Corps, the average cost of sand in the state will rise from $2.40 per ton to $7.65 per ton should these proposed restrictions be implemented; and

WHEREAS, The economy of this state will suffer as public and private construction costs soar because of the shortage of sand caused by these operating restrictions and tonnage limits: Now, therefore,

Be it resolved by the House of Representatives of the State of Kansas: That we urge the United States Army Corps of Engineers to consider the economic impact that reduced sand dredging in the Kansas River will have on construction costs in the State of Kansas; and

Be it further resolved: That the Chief Clerk of the House of Representatives be directed to send enrolled copies of this resolution to Col. John H. Atkinson, District Engineer, Kansas City District, United States Army Corps of Engineers, 700 Federal Bldg., Kansas City, Missouri 64106; the Kansas Congressional Delegation; and Ernest VanHoet, 5428 Ballentine, Shawnee, Kansas 66203.

House Resolution No. 6096 was sponsored by Representative Eugene P. Amos.

I hereby certify that the above RESOLUTION originated in the HOUSE, and was adopted by that body

May 1, 1989

Speaker of the House

Chief Clerk of the House

CORPS RESPONSE TO COMMENTS

7. Kansas House of Representatives
May 1, 1989

The Corps of Engineers prepared a letter in response to this Resolution. See letter in Appendix C - Coordination.

KANSAS STATE HISTORICAL SOCIETY

CENTER FOR HISTORICAL RESEARCH
120 West Tenth • Topeka, Kansas 66612-1291 • 913/296-3251

KANSAS MUSEUM OF HISTORY
6425 South West Sixth • Topeka, Kansas 66615-1099 • 913/272-8681

January 19, 1989

Colonel John H. Atkinson
District Engineer
Corps of Engineers, Kansas City District
700 Federal Building
Kansas City, MO 64106-2896

Dear Colonel Atkinson:

Staff review of the draft report "Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River," prepared by the Kansas City District has been completed. We are in agreement with the sections of the report describing the potential effects of the dredging regulatory plan on cultural resources located in and along the river. The proposed restrictions on dredging operations within specified distances from the banks or man-made structures within the river banks should insure the preservation of historic or archeological sites in those locations. As the report recommends we will be happy to comment upon the potential impacts of proposed dredging operations on a project specific basis. 1

Sincerely yours,

Ramon Powers
State Historic Preservation Officer

Richard Pankratz, Director
Historic Preservation Department

skm

RAMON POWERS, Executive Director
RUTH A. SHERRER, Associate Executive Director
TERRY MARMET, Director of Facilities Planning
MARK A. HUNT, Director of Museums and Historic Properties
PATRICIA A. MICHAELIS, Curator of Manuscripts
RICHARD D. PANKRATZ, Director Historic Preservation Dept

PORTIA ALLBERT, Library Director
EUGENE D. DECKER, State Archivist
THOMAS A. WITTY, State Archeologist
MARILYN HOLT, Director of Publications
LARRY JOCHIMS, Research Historian
JENNIE CHINN, Folklorist
RON PARKS, Public Relations Director

CORPS RESPONSE TO COMMENTS

8. Kansas State Historical Society
January 19, 1989

1 Comment is noted.

STATE OF KANSAS

Mike Hayden, Governor

KANSAS WATER OFFICE
Joseph F. Harkins
Director

Suite 200
109 SW Ninth
Topeka, Kansas 66612-1215

913-296-3185

April 10, 1989

Colonel John H. Atkinson
District Engineer
U.S. Corps of Engineers
700 Federal Building
Kansas City, MO 64106

Dear Colonel Atkinson:

Re: State of Kansas - Agency Comments on Draft Regulatory Report and Environmental Impact Statement For Commercial Dredging Activities on the Kansas River

The State of Kansas water-related agencies and other state agencies dealing with commercial dredging activities and their impact on the Kansas River, wish to thank the Corps of Engineers for the opportunity to review and comment on the draft document, "Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River." Inasmuch as the bed and banks of the Kansas River are the property of the State of Kansas, the state has a vested interest in the adoption or proliferation of new regulations affecting the river.

The state agencies participating in these comments have reviewed the draft report and have discussed the potential impacts of its proposals. While these agencies commend the Kansas City District for addressing the issue of commercial sand dredging and considering its past, current and future effects on the Kansas River and environs including: morphological impacts, ecological impacts and economic impacts, the agencies would like to bring some areas of concern to the attention of the Corps.

The Division of Water Resources, State Board of Agriculture, currently regulates commercial sand dredging operations in the channel of the Kansas River. The Division of Water Resources has serious concerns that the proposed restrictions on dredging may

CORPS RESPONSE TO COMMENTS

9. State Of Kansas
Kansas Water Office
April 10,1989

1 Comment is noted.

move dredgers out of the channel and on to the floodplain and banks, thus, outside of the Division's regulatory authority. Thus, commercial dredging would go from a highly regulated industry to one that is much less regulated. The Division of Water Resources is also concerned about the environmental and economic effects of dredging in the floodplain and on the banks such as: destruction of naturally occurring wetland areas, destruction of riparian green belts and animal habitat, bank destabilization, permanent open pits from sand removal, potential liability and hazards from operations and effect on levees and highway bridges. The Division of Water Resources believes that the state may need to promulgate additional regulations to establish authority to address these issues and regulate floodplain and bank operations.

The Kansas Water Office shares the Division of Water Resources' concerns enumerated above. The State Water Plan identifies the protection of wetland and riparian areas as a high state priority. The Kansas Water Office is also concerned that the river's aesthetics and recreational use and potential use are discounted and not addressed at all in the Corps' report. The Kansas River is identified for development of a river recreation program in the State Water Plan and is the most accessible of the navigable rivers in the state.

The Kansas Department of Wildlife and Parks (which will forward a separate statement to the Corps of Engineers) also participated in the discussion of agency concerns. They were especially concerned with the Environmental Impact Statement noting that it was particularly weak in the areas of recreation, threatened and endangered species and mitigation of damages to county, state and city parks and recreation facilities along the river. The Department of Wildlife and Parks felt the management plan should have reviewed recreational impacts inasmuch as the Kansas River is the largest recreational river in the state and is being considered by the National Park Service for designation in the Wild and Scenic River Program. Wildlife and Parks was also concerned that only Sec. 10 was used by the Corps as authority for the report and not Section 404.

The Attorney General's Office was concerned about the possibility of the new regulations forcing dredgers onto the floodplain and suggested that the state may want to promulgate regulations to deal with this contingency.

2 Comment is noted.

3 The aesthetics of the Kansas River was not discussed as a significant impact category in the Draft EIS because impacts on the aesthetics, resulting from dredging activities, are generally only of a localized nature. The existing disturbed condition of the river (railroad tracks, bank stabilization structures, indiscriminate dumping of trash) has a greater impact on the aesthetics than dredging. Recreational concerns are addressed in the report on pages EIS-31 and EIS-57. The presence of dredgers on the Kansas River should not inhibit development of a river recreation program as identified in the State Water Plan.

4 The Kansas Wildlife and Parks letter of April 13, 1989 follows this letter. Recreational impacts are addressed on page EIS-57. Very limited information is available from the State and other sources concerning existing recreation on the Kansas River. It should be noted that the 57-mile reach of the Kansas River that is being considered for designation in the National Wild and Scenic River System has been classified as being eligible for recreational river status. According to the 1980 draft report prepared by the Heritage Conservation and Recreation Service, now the National Park Service, this segment "did not meet eligibility for SCENIC classification due to the extensive shoreline intrusions and to the absence of outstanding scenic values."

5 The Corps of Engineers authority to regulate commercial dredging operations on the Kansas River is contained in Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403). No regulatory authority is granted under Section 404 of the Clean Water Act since the dredged material is processed entirely on shore.

6 Comment is noted.

The Secretary of State's Office was represented but had no comments at this time.

The Department of Commerce expressed concerns about the impact on business in Kansas and noted that this is just one more complication for entities trying to do business in Kansas. The Department of Commerce would like to encourage businesses to remain in Kansas by trying to keep the technicalities of doing business more simple. Commerce offered to assist any business adversely impacted by the effects of the Corps' regulations.

The Kansas Department of Revenue, which currently collects the Sand Royalty, stated that it is too early to know what effect the Corps' proposed regulations would have on reporting and collection of royalties.

The Kansas Department of Health and Environment (which has forwarded a letter under separate cover to the Corps) expressed support for the Corps' regulatory plan inasmuch as it protects public water supply intake structures which are effected by degradation of the river bed. The Kansas Department of Health and Environment would like Sec. IX of the Corps' plan to prohibit dredged return water from coming within 1000 feet upstream of any public water supply intake and would like return water near intakes to be passed through a siltation basin to prevent turbidity effects on treatment.

The Kansas Department of Transportation also reviewed the draft report and noted that a substantial portion of highway construction funds are expended for projects within the commercial area of the dredging operations on the Kansas River. It is recognized that highway construction costs in this area will increase as dredging operations become restricted. The Kansas Department of Transportation believes that the proposed dredging regulations are reasonable and prudent measures and supports the Corps' efforts to reduce the degradation of the Kansas River. The Department of Transportation is satisfied that sufficient evaluation of the problem and the impact of the proposed regulations has been accomplished and supports prompt implementation of the regulations.

This concludes the listing of comments and concerns of these Kansas state agencies dealing with commercial dredging activities on the Kansas River. Thank you for the opportunity to review your report and we hope the comments are helpful. Should you have any questions, please contact us.

Sincerely,

Joseph P. Harkins
Director

JPH:SAH:dk

CORPS RESPONSE TO COMMENTS

7 Comment is noted.

8 Comment is noted.

9 Comment is noted.

10 Requirements concerning a minimum distance between a dredge and a water intake structure and requirements concerning siltation basins will be considered on a case-by-case basis. The Kansas City District believes that potential impacts to drinking water supplies, from an individual dredging operation, should be evaluated on a site specific basis, since the potential level of toxic substances which may be released as a result of dredging operations varies from one reach of the river to another. All interested parties will be provided an opportunity to comment on all future requested permits prior to a determination by the Kansas City District to issue or deny those permits.

11 Comments are noted.

KANSAS WILDLIFE & PARKS

OPERATIONS OFFICE
RR 2, Box 54A
Pratt, Kansas 67124
316-672-5911

DEPARTMENT OF WILDLIFE & PARKS
MIKE HAYDEN, Governor
ROBERT L. MEINEN, Secretary
W. ALAN WENTZ, Assistant Secretary

April 13, 1989

Colonel John H. Atkinson
District Engineer
U.S. Department of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Ref:D1.0200
KS River
Dredging Study

Dear Colonel Atkinson:

This is in response to the Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River. The Kansas Department of Wildlife and Parks has reviewed the document to assess the potential impacts of the proposed sand dredging management plan on the Kansas River ecosystem, state and federally-listed threatened and endangered wildlife species and their habitat, public recreation resources and opportunities including Kansas River fisheries, established parks and other public recreation areas, boating opportunities, Department-owned or funded structures such as boat ramps or fishing piers, crucial wildlife habitats, and aesthetics. We are glad to see the Kansas City District of the Corps of Engineers has made the great effort to study the biological and physical effects of commercial dredging on the Kansas River and the politically-sensitive recommendation to restrict the industry's tonnage. This is a great improvement over the unrestricted sand dredging that currently occurs, especially in the lower river (RM 0-22). Although we see encouragement in these proposed restrictions, we are not convinced ecologically or economically that the proposed management plan is strict enough, nor that the Environmental Impact Statement (EIS) under the National Environmental Policy Act and the economic study are adequate. A more comprehensive EIS would provide for more judicious management decisions, facilitate well-informed critiques by interested parties including the general public, and could lead to the formulation and selection of different management alternatives. We suggest that the Kansas City District implement their plan on a temporary but accelerated basis to protect the Kansas River's natural resources, while reformulating their biological, economic, and recreational-impact analyses.

Below please find more specific comments with their associated attachments.

1

2

CORPS RESPONSE TO COMMENTS

10. Kansas Department Of Wildlife And Parks
Operations Office
April 13, 1989

1 Comment is noted.

2 The information contained in the Final EIS is of an adequate scope and does comply with the requirements of the National Environmental Policy Act (NEPA). The information gathered by the Corps during the scoping process for this project was used in the preparation of the EIS as required by section 1501.7 of NEPA. It should be noted that a monetary cost-benefit analysis is not required for an EIS under NEPA (section 1502.23). However, the Corps did feel that certain, significant, costs were relevant to the decision process and these are included in the Regulatory Report and Final EIS. The Corps decision to select the restricted dredging alternative will always be subject to change based on the latest available information. The Corps would review this decision if any new information is provided to them that may justify the selection of some other alternative. This new decision would also have to undergo the NEPA process.

STRUCTURES: The Kansas Department of Wildlife and Parks has funded or constructed several public boat ramps along the Kansas River, partially with Dingle-Johnson Federal Aid (D-J) dollars. Fishing piers and jetties are also built. Land and Water Conservation Funds (LWCF) are used to purchase land for public parks and recreation areas and to build roads, trails, water-intake and waste-water outflow pipes, and other facilities for these areas. There is no mention of the instream structures or bank-side structures that our Department owns, operates, or funds nor apparently any consideration for the special restrictions involved with D-J and LWCF monies and their projects in the management plan, economic analysis, and EIS.

3

STATE THREATENED AND ENDANGERED WILDLIFE: The Kansas City District contacted the Kansas Department of Wildlife and Parks, then the Kansas Fish and Game Commission, in August 1985 for a list of threatened and endangered wildlife. Since then our list has changed greatly. Several species described in the report, the Topeka shiner, *Notropis topeka*, blue sucker, *Cycleptus elongatus*, and prairie falcon, *Falco mexicanus*, have been reclassified as Species In Need of Conservation (SINC) and are no longer considered as State Threatened. Under the Kansas Nongame and Endangered Species Conservation Act, the taking or purposeful killing of endangered, threatened, and SINC species is prohibited without a special permit. The law also lends protection to the habitat for threatened and endangered species. There have also been additions to the threatened and endangered list since 1985. Most notably, the flathead chub, *Hybopsis gracilis*, chestnut lamprey, *Ichthyomyzon castaneus*, snowy plover, *Charadrius alexandrinus*, and Eastern hognose snake, *Heterodon platyrhinos* which occur in or along the Kansas River have been listed as State Threatened. There is Designated Critical Habitat for bald eagles, *Haliaeetus leucocephalus*, flathead chubs, and Northern crawfish frogs, *Rana areolata circulosa*, within the study area of the dredging report. Please find the attached list of State-listed threatened, endangered, and SINC wildlife species.

4

The Topeka shiner prefers large open pools near the headwaters of small streams with permanent flows. References to this SINC species with regards to Kansas River dredging are not biologically intuitive. Flathead chubs depend on large rivers with sand bottoms. Both the snowy plover and Eastern hognose snake use open, sandy areas along rivers. The snowy plover prefers wetlands and the open beaches and sand bars of rivers. The snowy plover, piping plover, and flathead chub prefer shallow, flowing, sandy, braided-channels.

The state and federally-listed endangered bald eagle uses riparian timber as winter roosts and foraging perches. There is little or no mention of the impact of sand dredging or the proposed management plan on the riparian timber along the Kansas River, nor on their prey (e.g., fishes, waterfowl).

CORPS RESPONSE TO COMMENTS

As a result of further coordination with the Kansas Department of Wildlife and Parks it was learned that there are no facilities, funded with Land and Water Conservation Funds (LWCF), located along the Kansas River. There are four public boat ramps on the Kansas River, three of which are in reaches of the river that do experience significant amounts of dredging (Edwardsville, Lawrence, and Topeka). The Corps recognizes that these structures may experience some amount of damage as a result of riverbed degradation. However, this damage is not of the same magnitude as damage to bridges and pipelines and do not have the same potential catastrophic results if they fail. Due to the length of the Kansas River and the vast number of structures and facilities located on or along the river, only the most significant structures are included in the Regulatory Report and Final EIS. This assessment of the structures is only intended to present the general magnitude of actual and potential damages that have been, or may be, experienced by non-dredging interests as a result of the existing dredging activities on the Kansas River.

Comments are noted,. The Final EIS has been changed to reflect this information.

With this current list, the EIS can be re-evaluated and written in a more relevant fashion.

FEDERALLY-LISTED ENDANGERED AND THREATENED SPECIES: As stated in the EIS, all federally-listed wildlife species that occur in Kansas are also included on the State's list. There is no corresponding authority for the Kansas Department of Wildlife and Parks to protect federally-listed plants.

In the Federal Coordination appendix, pages C-8 through C-10, the U.S. Fish and Wildlife Service formally requested that the Army Corps conduct a biological assessment to determine the effects of the proposed management plan on listed and proposed species as provided by Section 7(c) of the Endangered Species Act and as part of the Corps' compliance with Section 102 of the National Environmental Policy Act. We concur with the U.S. Fish and Wildlife Service for the need of this assessment and wonder why the Corps' has not complied with this request.

FISHERIES: The Report and EIS quote liberally from Dr. Cross' 1982 Report on the Impacts of Commercial Dredging on the Fishery of the Lower Kansas River. The EIS is misleading not because it misquotes Dr. Cross' report or because his research is flawed, but rather because of taking his conclusion of increased habitat diversity resulting in increased fish species richness out of context when applying it to your preferred management alternative. The EIS analysis in this aspect is qualitative and quantitative data are not presented. Words such as "excessive" and "limited dredging activities" resulting in "reduced" or "increasing" habitat diversity are very hard to refute. Why not attempt to apply the same standard as used in the morphological impacts which uses "tons of sand", "feet of degradation in elevation" to fisheries and ecological impacts (i.e., tons of fish, acres of optimum habitat). The Corps' could use quantitative approaches such as the U.S. Fish and Wildlife Service's Habitat Evaluation Procedures or Instream Flow Incremental Method to model Kansas River habitat losses under different scenarios. When evaluating aquatic ecosystem impacts, especially in the lower reaches of the Kansas River, losses to obligate stream-dwelling species should not be simply balanced by gains to reservoir-tolerant species.

CRUCIAL WILDLIFE HABITATS: The Kansas Department of Wildlife and Parks lists riparian woodlands, free-flowing rivers, and wetlands as crucial wildlife habitats in its Strategic Plan. Executive Order 1190 was issued to protect wetlands. By allowing the river elevation to continue to decline due to sand dredging, wetlands in some reaches are dewatered by dropping the water table. Riparian woodlands reduced to strips in many areas due to agriculture and urban encroachment, are falling in as banks collapse due to sand dredging.

CORPS RESPONSE TO COMMENTS

5 Comment is noted. A biological assessment has been coordinated with and approved by the U.S. Fish and Wildlife Service, Manhattan, Kansas office and is attached as Appendix D.

6 Information from Dr. Cross' report, that was used in the draft EIS, has not been taken out of context. His report was prepared to address "impacts of commercial dredging on the fishery of the lower Kansas River." This is the same information that is required to be in an EIS. The lack of quantitative data are a result of the lack of a well tested, commonly used, quantitative methodology. Significant problems have been documented in both the species models used in the U.S. Fish and Wildlife Service's (FWS) Habitat Evaluation Procedures and in applying the Instream Flow Incremental Method to midwestern warm water streams. Initial scoping of Dr. Cross' study was closely coordinated with the FWS and in their November 12, 1985 coordination letter (See Appendix C - Coordination), the FWS stated that they "generally concur with the analysis of effects, conclusions and presented alternatives." They also encouraged "liberal use of this report within the EIS."

7 The selected alternative is intended to minimize such potential impacts.

SECTION 404 OF THE CLEAN WATER ACT: We noticed that the Kansas City District has only issued this report and draft EIS under Section 10 of the Rivers and Harbors Act of 1899, and has excluded its regulatory powers under the Clean Water Act since the dredged material is processed entirely on shore. We disagree and feel that some fill impacts the navigable river and its associated inchannel and riparian wetlands. Current sand dredging activities are accelerating the sloughing of the banks of the Kansas River and therefore locally filling river channel and wetlands.

RIVER MORPHOLOGY: The Kansas City District has done an excellent job in modeling the morphology of the Kansas River and the potential impacts of different sand dredging management plans. The plan the Corps prefers calls for allowing an average 2 ft drop in stream bed elevation within a 10 mi river reach before dredging is suspended. We hope the Kansas City District gets the mandate, funding, and manpower from the U.S. Army Corps of Engineers to carefully monitor the Kansas River for its 171 miles from Junction City, Kansas to its confluence with the Missouri River at Kansas City.

AESTHETICS: The Kansas River, from the confluence with the Delaware River downstream to the Interstate Highway 635 bridge crossing, has been included in the final list of rivers in the 1982 Nationwide Rivers Inventory and proposed as a component of the National Wild and Scenic Rivers System. In the President's August 2, 1979 environmental message, Federal Agencies, including the Army Corps of Engineers, were directed to take care to avoid or mitigate adverse effects on rivers identified in the National Rivers Inventory. Primary emphasis was given to maintaining and enhancing the historic, aesthetic, recreation, fish and wildlife, and geologic values of the 57-mile segment of the Kansas River. We disagree that the alternative management plans including the No Action Alternative, the Restricted Dredging Alternative and the Dredging Ban Alternative would have no impacts on the aesthetics and the possible designation of the Kansas River as a National Recreational River.

ECONOMICS: The economic analysis focuses on the costs of construction in the Kansas City area, the economic impact of the sand dredging industry to local communities with its jobs and taxes paid, and costs to nondredging entities due to losses from damage to manmade structures, water supplies, and land adjacent to the river. Since the Kansas River is one of only three public rivers in the State of Kansas and unlike the Arkansas River, has water for its entire course, we feel the value of the Kansas River as a public recreational resource has been basically overlooked in this report. By allowing the highest quality construction sand, according to the report, to be dredged at one of the nation's lowest prices, the State of Kansas is basically giving away one public resource, Kaw River sand, at the expense of several others including public recreation. The State's excise tax revenues for

CORPS RESPONSE TO COMMENTS

8 Unintentional bank erosion resulting from commercial dredging activities is not considered a fill activity under Part 323 of Federal Regulations 33 CFR Parts 320 through 330. Therefore, no authority to regulate such impacts is available under Section 404 of the Clean Water Act.

9 Comment is noted.

10 It should be noted that the 57-mile reach of the Kansas River that is being considered for designation in the National Wild and Scenic River System has been classified as being eligible for recreational river status, not scenic status. According to the 1980 draft report prepared by the Heritage Conservation and Recreation Service, now the National Park Service, this segment "did not meet eligibility for SCENIC classification due to the extensive shoreline intrusions and to the absence of outstanding scenic values." The aesthetics of the Kansas was not discussed as a significant impact category in the draft EIS because impacts on the aesthetics, resulting from dredging activities, are generally only of a localized nature. The existing disturbed condition of the river (railroad tracks, bank stabilization structures, and indiscriminate dumping of trash) has a greater impact on the aesthetics of the Kansas River than dredging. It is the Corps position that the impacts associated with sand and gravel dredging do not significantly impact the recreational potential of the Kansas River.

11 The economic information included in this report concentrates on the most severe impacts along with those impacts for which information was readily available for assessing. Trying to assess the economic impacts to the "public recreational resource" of the Kansas River would be highly subjective. Little information is available on the recreational use of the Kansas River. The draft report prepared by the Heritage Conservation and Recreation Service (now the National Park Service) in 1980 to propose adding the Kansas River to the National Wild and Scenic Rivers System states; "At present, the upper area of the river, at Lawrence supports the heaviest recreational use.... Downstream from the Lawrence area, recreational use decreases due to the lack of facility development and access points along the river. However, use does increase somewhat on the river segment near

Kansas River sand dredging are anticipated to be cut in half if the Corps' management plan is put into affect. Based on 1988 revenue figures, State excise revenue will be reduced from $78,000 to $39,000 for mining approximately 2 million tons of sand annually. Sand excise tax is still set at the same rate as it was at the inception of the State program without regard to inflation or the public's costs of repairing banks, levees, water intake structures, weirs, boat ramps, bridges, pipelines, etc. We feel the economic analysis is flawed and does not account for the values of a public, free-flowing river such as its fisheries, wildlife habitat including Designated Critical Habitat for threatened and endangered species, hiking opportunities, canoeing and boating opportunities, and wildlife observation opportunities, the costs involved in repairing and replacing these features when damaged by dredging, and the economic impact on local and state economies of monies spent on public recreation on the Kansas River. We are dissatisfied when you describe impacts to recreation and aesthetics as "relatively minor" (Page 21 Draft Regulatory Report) and dismiss them from discussion.

Thank you for providing us this opportunity to comment.

Sincerely,

William G. Layher, Ph.D.
Supervisor
Environmental Services Section

WL/lz/bd
xc: Reg. 2, Hawks
USFWS, Finley
EPA, Barber
DWR, Pope
KWO, Harkins
Nat. Pk. Serv., Castleberry

CORPS RESPONSE TO COMMENTS

11

Kansas City. Although there are no developed areas, an undetermined amount of fishing hiking hunting, trapping, boating, and canoeing takes place." It should also be noted that in 1981 the Kansas Fish and Game Commission classified the upper Kansas River (upstream of Lawrence) as a high-priority fishery resource while the lower Kansas River (downstream of Lawrence), where most of the dredgers are located was classified as a moderate fishery resource. This was on a four class rating scale of: I-Highest Value, II-High Priority, III-Moderate, IV-Limited. These ratings were based on six criteria; 1. Fishery Characteristics, 2. Angling Use, 3. Water Quality, 4. Stream Uniqueness, 5. Riparian Association, 6. Habitat Restoration, Reclamation or Mitigation Potential. We recognize that the Kansas Department of Wildlife and Parks has the responsibility to protect the natural resources of the state of Kansas. However, no information is readily available to indicate that recreation has been severely impacted with the existing dredging operations or will be in the future under the proposed Regulatory Plan..

John Ashcroft
Governor

John A. Pelzer
Commissioner

State of Missouri
OFFICE OF ADMINISTRATION
Post Office Box 809
Jefferson City
65102

Stan Perovich
Director
Division of General Services

February 15, 1989

Colonel John H. Atkinson
U.S. Army District Engineer
Corps of Engineers
Kansas City District
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Colonel Atkinson:

Subject: 89010046 - Draft Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River (January, 1989)

The Missouri Federal Assistance Clearinghouse, in cooperation with state and local agencies interested or possibly affected, has completed the review on the above project application.

None of the agencies involved in the review had comments or recommendations to offer at this time. This concludes the Clearinghouse's review.

A copy of this letter is to be attached to the application as evidence of compliance with the State Clearinghouse requirements.

Sincerely,

Lois Pohl, Coordinator
Missouri Clearinghouse

LP:cm

CORPS RESPONSE TO COMMENTS

11. State of Missouri
Office of Administration
February 15, 1989

No response necessary.

Johnson County
Kansas

February 17, 1989

John H. Atkinson
Colonel, U. S. Army District Engineer
Department of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, MO 64106-2856

Subject: Draft Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River

Dear Colonel Atkinson;

The Johnson County Environmental Department has reviewed the subject report. We have found it to be very complete. We appreciate the Corps interest in regulating dredging on the Kansas River. Unregulated dredging can have severe impacts on tributary stability, local water tables, flora and fauna, and structural stability of bridges and pipeline which cross the river. We encourage the Corps to optimize the proposed monitoring program and to include dredged return water restrictions.

We appreciate the opportunity to review the document. The department would like to be kept apprised of any future actions concerning this matter.

Sincerely,

Betsy Betros
Director, Pollution Control Division

BB:km/441846.LTR

cc: Randy D. Bradley, Director, Johnson County Environmental Department

Environmental Department 205 Flaming Drive Olathe, Kansas 66061 (913) 780-5423 Fax (913) 780-2637

CORPS RESPONSE TO COMMENTS

12. Johnson County Environmental Department
February 17, 1989

1 Comments are noted.

City of Lawrence
KANSAS

CITY COMMISSION
MAYOR
BOB SCHUMM
COMMISSIONERS
MIKE AMYX
DENNIS CONSTANCE
SANDRA K. PRAEGER
MIKE RUNDLE

BUFORD M. WATSON JR. CITY MANAGER

CITY OFFICES 6 EAST 6th
BOX 708 66044 913-841-7722

January 31, 1989

Department of the Army
(Attn: OD-P)
Kansas City District
Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

RE: "Regulatory Report and E.I.S. for Commercial Dredging on the Kansas River"

Dear Sir:

We, in Lawrence, are very interested in any activities on the Kansas River since it is the source of a good portion of our water supply. As indicated by the draft Regulatory Report, most of the dredging activities occur downstream from river mile 22; however, we do have some dredging activity in our immediate area. We have three areas of concern: Bowersock Dam which creates the pool for our water intake; the water intake is adjacent to the Kansas River water plant; and our sanitary sewer force main river crossing. We believe that the concerns about the Bowersock Dam expressed on page 14 of the draft regulatory report and the restrictions placed on dredging activities near the dam, water intake structures and pipe lines on pages 31 and 32 of the report address our concerns. However, we would appreciate having the Lawrence water intake and the sanitary sewer main crossing specifically identified in the final document. We generally support the Regulatory Plan as proposed and ask that we be kept informed of river activity around the City of Lawrence, especially as it pertains to Bowersock Dam, the Lawrence water intake and our sanitary sewer river crossing.

Very truly yours,

Buford M. Watson, Jr.
City Manager

BMW/ce

CORPS RESPONSE TO COMMENTS

13. City Of Lawrence
January 31, 1989

1

A specific discussion concerning the water intake structure and sanitary sewer mains, owned by the City of Lawrence, will not be incorporated into the final document. The City's water intake structure is located upstream of Bowersock Dam and is outside the existing area of concern addressed in the Environmental Impact Statement. The sewer mains are identified in the Environmental Impact Statement in TABLE EIS-5 and TABLE EIS-12. Restrictions affecting dredging operations near water intake structures are presented in Section VII. B. of the Dredging Restrictions in the Regulatory Plan. Restrictions concerning dredging operations near pipeline crossings are presented in Section VII. D. of the Dredging Restrictions in the Regulatory Plan. The City of Lawrence will be provided with am opportunity to comment on all future dredging activities, on the Kansas River, which require Department of the Army authorization.

Holliday
SAND AND GRAVEL COMPANY
6811 WEST 63RD STREET
OVERLAND PARK, KANSAS 66202
(913) 236-5920

January 30, 1989

Colonel John H. Atkinson, District Engineer
Kansas City District, U. S. Army Corps of Engineers
700 Federal Building
Kansas City, MO 64106

Dear Colonel Atkinson:

The sand producers below Bowersock dam met to discuss the Draft Regulatory Plan for Commercial Dredging Activities on the Kansas River. We will comment in more detail before the March 17, 1989 closing date, but thought it would be useful to express our questions and concerns prior to the February 15 hearing. Perhaps your staff could address these issues at that time.

Our first concern is the time in which the Regulatory Plan will be implemented. Our need to acquire new locations, new equipment, financing and zoning dictates as long a lead time as possible. Gradual phasing of restricted dredging is much less use to us than a longer lead time. Individual companies will respond concerning their particular problems in this regard.

Our second concern is the 5-mile, 2-foot limit. Of the measures suggested in the Simons, Li & Associates report, this seems one of the more severe. Can a longer river length be considered? Will consideration be taken in drought cycles of unusually low natural flow? Are there areas of the river where more than 2-foot degradation would be preferable to moving dredging operations to a more sensitive part of the river? Can the warning time given be lengthened?

CORPS RESPONSE TO COMMENTS

14. Holliday Sand And Gravel Company
January 30, 1989

1

The Regulatory Plan will be implemented early in 1990. The Plan will be implemented with no phase-in period for dredging operations in previously undredged reaches of the river, including the newly opened reach of river upstream of Bonner Springs. The Plan will be phased-in over a 3-year period for existing dredging operations located in previously dredged reaches of the river, except for the newly opened reach of river upstream of Bonner Springs. This proposal is consistent with the recommendation provided by the U.S. Environmental Protection Agency, in their letter of comment dated March 9, 1989, that the Plan should be phased in over a 3-year period or less.

2

The restriction limiting riverbed degradation to an average of 2 feet for any 5-mile-long reach of the river will not be modified, nor will any exceptions be made for periods of drought or for particular reaches of the river. The limitations presented in Section I. of the Dredging Restrictions in the Regulatory Plan are considered to be the minimum requirements necessary to keep secondary impacts, which result from dredging-induced degradation, at an acceptable level. The Kansas City District will notify the producers of its intent to close a given reach of river as far in advance as is possible. Implementation of the monitoring program is expected to provide the producers with approximately 2-3 years notice prior to the closure of a dredged-out reach of river. If an unforeseen event such as a flood causes excessive lowering of the riverbed, which requires the unexpected closure of a reach of river, the affected producers will normally be allowed to continue dredging in that reach for one year in order to allow sufficient time for the relocation of their operations.

Third, we hope there will be some flexibility in the monitoring required. We will get a cost estimate but believe the outlined program will be very expensive. Can cross-sections be taken less frequently? Are cross sections always necessary in areas where no dredging is taking place? Could we suggest less costly alternatives for monitoring?

3

Fourth, we are concerned that the 300,000 tons per site and 500,000 tons per 10 mile reach limits might work unintended hardships if applied inflexibly. Plants cannot be sited strategically on the river to optimize sand production but are limited by local authorities and road systems. Would a 750,000 tons per 15 mile reach be acceptable? Could more than 300,000 tons per site be considered provided aggregate limits for the reach were not exceeded?

4

Fifth, we are concerned that the Draft Plan does not hold out any hope that should accretion occur, the regulation could be lessened. We still have doubts about the severity of degradation on the river. Are there no possible future circumstances that would allow greater production?

5

CORPS RESPONSE TO COMMENTS

The number and frequency of channel cross-section and water surface profile collections have been reduced in the final Regulatory Plan in an effort to reduce monitoring costs. These data collections will not be required in the reach of river downstream of Turner Bridge (bridge located near river mile 9.3), unless a dredge is operating in that reach. The frequency of channel cross-section and water surface profile collections during the first 4 years after implementation of the Regulatory Plan has been reduced. The second data collection, which was to occur 2 years after implementation of the Regulatory Plan, has been deferred until the fourth year after implementation of the Plan. The change in channel cross-section and water surface profile requirements described here will not significantly impact monitoring efforts; however, no additional reductions are considered feasible, if reliable monitoring of dredging impacts is to be achieved.

The 500,000 ton extraction limit per 10-mile-long reach of river, presented in Section II.B. and D. of the Dredging Restrictions in the draft Regulatory Plan, has been changed to a 750,000 ton extraction limit per 15-mile-long reach of river in the final Plan. This change provides more flexibility for siting dredging operations on the river, and will reduce the potential for disruption of existing permitted dredging operations in the Topeka area and the lower river. The change is consistent with the intent of the Regulatory Plan since the maximum annual average rate of extraction per mile-long reach of river, subject to this restriction, will remain at 50,000 tons of material, and since this change is not expected to appreciably increase impacts to morphologic, ecologic or economic parameters. The 300,000 ton annual limit per individual dredging operation is considered to be the maximum allowable amount of material that can be extracted annually, if localized impacts are to be kept at an acceptable level. Therefore, no increase in this limit is considered appropriate.

If monitoring efforts reveal that riverbed elevations in a 5-mile-long reach of river being dredged are increasing instead of degrading, consideration could be given to increasing the rate of extraction in that reach provided such increases are consistent with the intent of the Regulatory Plan and that they do not create unacceptable impacts in other reaches of the river.

Finally, we quickly determined at our meeting that we could not agree to division of the allowed quantities for dredging. How does the Corps plan to divide the available sand between us? What flexibility will there be in quotas? How far ahead will we be able to promise supply to our customers?

We look forward to further discussion of these issues which are vital to us, our employees and our customers.

Yours very truly,

KAW VALLEY SAND & GRAVEL, INC.
BUILDERS SAND COMPANY
KAW SAND COMPANY
HOLLIDAY SAND & GRAVEL COMPANY

Charles E. Clark, for the Producers

CEC:jj

cc: Kaw Valley Sand & Gravel, Inc.
Builders Sand Company
Kaw Sand Company

6

CORPS RESPONSE TO COMMENTS

The division of limited resources among more than one applicant will depend upon a number of circumstances, such as the reach of river to be dredged and the number of applicants applying to dredge in that reach. Therefore, such decisions will be deferred until the Regulatory Plan has been implemented, existing permits have expired and new applications have been received. It may not be advisable for some producers to make certain commitments to customers until the Regulatory Plan has been implemented and new permits have been issued.

Holliday
SAND AND GRAVEL COMPANY
6811 WEST 63RD STREET
OVERLAND PARK, KANSAS 66202
(913) 236-5920

April 14, 1989

District Engineer
Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, MO 64106

Dear Sir:

We wish to comment on the Regulatory Plan for the Kansas River. Our comments may be summarized as follows:

1. We request a two year grace period for existing Kansas River operations without reduction of production. This would allow time for siting alternate plants without disruption of the marketplace.

2. We request recognition of the special need for Kansas River sand for production of fiberglass insulation.

3. We request the limit per site below the Santa Fe Bridge at Bonner Springs be raised to 500,000 tons per year.

4. We request four year intervals for river surveys due to the expense of the monitoring program.

Holliday Sand & Gravel Company has been dredging sand from the Kansas River since 1947. We have six dredge permits in force and currently operate three Kansas River sand plants at and below Bonner Springs with an average annual volume since 1964 of 1.3 million tons, and an average volume of 1.9 million tons since 1984.

CORPS RESPONSE TO COMMENTS

15. Holliday Sand And Gravel Company
14 April 1989

I. Grace Period

We request that the "phase in" period of the Regulatory Plan contain a grace period of two years without tonnage or degradation restrictions. Any reduction below marketplace demand in Kansas City will result in shortages and rationing of sand. A phased reduction before alternate sources of supply are in place, therefore, would result in substantial disruptions in the market.

Our present plants are operating multiple shifts often on six and seven day weeks. Some of our contracts for delivery of sand to paving contractors are bid two years before delivery and require State specification material often available only at one of our plants. Continuity of production is essential to our customers.

We are now beginning to realize what an unusual asset our existing plants with "grandfathered" zoning are. Since they were built, urbanization has spread around them. New sites in the flood plain will require substantially more time and money to zone and outfit than we are accustomed to.

The Kansas City area producers have not been idle during the study period. Our company has spent substantial sums for drilling and property options in the flood plain. We attempted to zone a site and were turned down by the City of Shawnee. We explored another site and met substantial resistance from environmental agencies and the City of Kansas City, Kansas.

In our opinion, flood plain pit mining will not adequately supply the Kansas City market. While some limited pit mining will undoubtedly take place, acreage cannot be acquired, zoned and stripped of overburden on the scale and in the time frame required. We believe Missouri River production is vital to continuity in the marketplace.

Missouri River operations are very expensive, requiring different equipment and a much larger capital investment than Kansas River or pit operations. We are currently acquiring, permitting and zoning a new plant site at Riverside, Missouri. We are budgeting in excess of two million dollars for the bank site land and equipment. We estimate an additional two million dollars will be required for river equipment. This is a very large investment for a small company.

Beyond the expense, siting a new plant on the Missouri River requires a minimum of two years to accomplish all of the following:

a. Locating at least 15 acres of land for sale with river and highway access.

CORPS RESPONSE TO COMMENTS

1

Implementation of a grace period with no limit on the quantity of sand and gravel that could be extracted from the river or on riverbed degradation would not be in the public interest, since implementation of such a plan could result in additional unacceptable impacts to the river's morphology and ecology and to nondredging interests located in and along the river. In addition, delaying implementation of the Regulatory Plan is not considered reasonable since the producers have been aware for at least a decade that the Kansas City District was anticipating restricting dredging activities on the river.

CORPS RESPONSE TO COMMENTS

b. Locating a river site with adequate water depth on the channel side of the river, but not obstructing navigation.

c. Obtaining local zoning requiring a Special Use Permit. We find cities reluctant to permit sand stockpiles. Most would really prefer light industrial uses or office parks. Since most sand is sold for resale as asphalt or concrete, we do not offer a good source of sales tax revenue and hence are a less desirable land use.

d. Providing esthetic improvements to plant sites, including a brick office, paved roads and extensive tree planting for screening.

e. Re-establishment of any filled wetland areas on the floodplain site.

f. Almost without exception, improving a railroad crossing. We are required at Riverside to pay for a $100,000 controlled signal crossing.

g. Upgrading of city streets for heavy truck traffic.

h. Acquiring a new floating plant barge.

i. Constructing a new barge mounted processing plant.

j. Acquiring four new sand barges.

k. Acquiring an 800 horsepower towboat.

l. Constructing barge unloading equipment.

m. Acquiring and erecting secondary washing equipment for lignite removal. Lignite is lightweight coal that must be removed before Missouri River sand is suitable for concrete flatwork.

n. Converting an existing Missouri River contractor dredge for sand production.

o. Clearing and grading the site.

p. Erecting 1,850 feet of conveyor.

q. Constructing 2,400 feet of subsurface drains.

r. Constructing 200 feet of tunnel.

s. Erecting truck loading hoppers.

t. Building a river dock.

u. Paving 2,500 feet of road.

v. Building an office.

w. Installing a truck scale.

Until alternatives such as this new Missouri River plant are in place, a reduction on the Kansas River will result in shortages in Kansas City.

II. Fiberglass Sand

We request recognition of the continuing need for fine sand from the Kansas River for processing into a fiberglass sand. No economical alternative exists and only under the most extreme circumstances should dried sand production from the Kansas River be curtailed.

Missouri River sand is too low in silica and potassium oxide and too high in iron oxide, magnesium oxide, sodium oxide and ignition loss. Owens-Corning and Certain-Teed in Kansas City and Manville Corporation in McPherson, Kansas rely on Kansas River sand raw material for fiberglass with substantial numbers of people employed and value of product produced.

The two dry sand plants in Kansas City are located on the Kansas River, producing 250,000 tons of dried sand annually. Flood plain pits cannot be zoned within any reasonable distance from the drying facilities. The added costs of pit processing and hauling back into the city, estimated at $3.00 per ton minimum, would render us uncompetitive with out-of-state suppliers. Producing fiberglass sand in Kansas City is already more costly than natural pure-silica sand production in Illinois or Oklahoma. This is because of their larger overall volume and the additional cost of de-ironizing Kansas River sand with magnetic separators. This cost differential is offset, however, by our short haul distance and by the natural occurrence of alumina in Kansas River sand. Alumina is expensive and must be supplemented when using pure silica sands from Illinois or Oklahoma.

We request that priority be given to dried sand in the Regulatory Plan. Production for other purposes, where alternatives will exist, should be first curtailed. Cutting off the only economical source of fiberglass sand should be a last resort.

III. 500,000 Tons Per Site

We request the limit per dredge site below the Santa Fe Bridge at Bonner Springs and above the Johnson County weir be set at 500,000 tons per year. With an overall limit of 1,000,000 tons and with existing controls on the river in this reach, we do not feel an increase to 500,000 tons per site will have a detectable negative impact.

CORPS RESPONSE TO COMMENTS

2 Comment is noted.

3 Section II.A. of the Dredging Restrictions in the Regulatory Plan provides for the removal of a maximum of 1 million tons of sand and gravel annually from the reach of river located downstream of mile 21.2. Therefore, sufficient material is available to meet the 250,000 ton requirement for fiberglass sand.

4 Refer to response 4. to Holliday Sand And Gravel Company's January 30, 1989, letter.

Consolidation of dredge sites, on the contrary, would have a positive impact on local communities by limiting noise and traffic to fewer areas. It would reduce the number of localized dredging impacts on the river itself. Since 600,000 to one million tons are presently being removed per dredge site, allowing 500,000 tons can only reduce the level of localized impact from the pre-Regulatory condition.

IV. Four Year Intervals

We request the time interval for cross-section surveys under the Monitoring Program be increased to 4 years. We estimate 130 cross-sections will be needed over 75 river miles. This is a major undertaking with a large cost. During the initial stages of the Regulatory Plan it is unlikely degradation will occur at a rapid rate requiring more frequent monitoring.

We would be pleased to furnish additional information about our comments at any time.

Yours very truly,

HOLLIDAY SAND & GRAVEL COMPANY

M.R. Odell

Mike Odell
Production Manager

MO:jj

CORPS RESPONSE TO COMMENTS

5 Refer to response 3. to Holliday Sand And Gravel Company's January 30, 1989, letter.

KAW SAND COMPANY
DREDGING CONTRACTORS
P. O. BOX 554 LAWRENCE, KS 66044
(913) 843-0714

February 8, 1988

Col. John H. Atkinson
Reg. Functions Branch
Kansas City District
Room 706, Fed. Bldg
601 E. 12th Street
Kansas City, MO 64105

Re: DeSoto Dredging Permit

Dear Col. Atkinson:

I join with the other dredgers to express our serious reservations about the proposed regulations, especially the two-foot degradation and the monitoring requirements. Therefore, I want to put forth some serious objections that put me at odds with the interests of two other dredgers; Builders Sand and Holiday Sand.

Over ten years ago, I wanted to get a river permit in the Kansas City area, notably near DeSoto, so I inquired with the Corps of Engineers. I was told that no new permits would be given until their studies were finished; which would probably take another year. Well, the studies have never come to an end. Meanwhile, the sand companies in the Kansas City area were granted new permits and were permited to transfer permits without tonnage limitations. This was even allowed around a less stable dam structure (the coffer dam of Johnson County Water District No. 1) than the Bowersock at Lawrence where I had severe limitations placed on me.

After obtaining land in 1983, I applied for river permits at two locations in the DeSoto area about nine miles apart. After objections to the endless study period and the granting of permit transfers, the Corps of Engineers gave Builders Sand and myself permits with 250,000 tons limitations near DeSoto in 1986. Holiday Sand was later also granted a limited permit.

CORPS RESPONSE TO COMMENTS

16. Kaw Sand Company
February 8, 1988
(Original letter is dated wrong; should be 1989 instead of 1988)

1 Comment is noted.

2 Late in the 1970's when the Kansas City District was initiating its evaluation of commercial dredging activities on the Kansas River the District determined that it would not allow dredging operations to move into previously undredged reaches of the lower river, until its evaluation was completed. In addition, the District determined that it would not allow an increase in the number of dredges operating on the lower river while its evaluation was in progress; however, existing dredging operations on the lower river would be allowed to move within previously dredged reaches of the river during the District's evaluation, since such moves were necessary to maintain those operations and since the moves would not result in an increase in dredging-related impacts. In the mid-1980's it became apparent to the Kansas City District that the issues involved in the District's evaluation of potential dredging impacts were extremely complex and that a resolution of the matter could take several additional years. Therefore, in 1986 the District determined that it would issue a limited number of interim permits, with appropriate restrictions, to allow dredging in the previously undredged reach of river located between Bonner Springs and Bowersock Dam at Lawrence. Since the District had not concluded its evaluation of dredging impacts it was determined that no more than 1 permit would be issued to any company and that an annual extraction limit of 250,000 tons of material would be imposed on each permitted operation in the newly opened reach of river. These conditions will remain in force until implementation of the Regulatory Plan.

With the new rules, only three plants could operate in the 15 miles upstream from Bonner Springs. Basing their arguments on market share, Builders and Holiday are objecting to my second plant to the West of DeSoto. Their rationale leaves a lot to be disired. Their stratagy is basically to push for a long implentation of the cuts in production below Bonner Springs and to guard their unused DeSoto permit for future use.

To the market share arguement, let me give a couple of obvious answers. It has been impossible during the last 12 years for any sand competitor to develop a market share in the Kansas City area. During those years, the Corps of Engineers locked up the only feasible source of sand to any outsider. At the same time, the Corps allowed those who were there already to supply the total market by new permits or permit transfers to new reaches without tonnage limitations. The Corps, by its long studies and unequal treatment, artificially benefited and sustained the market share of Builders Sand and Holiday Sand.

Holiday and Builders got their permits in the DeSoto area under false pretences. They claimed they had to have them out of necessity. They did not need them in 1986 and still do not need them. To date in 1989, they have never obtained zoning to set up a sand plant. They are only reserving them for future use.

By contrast I owned my land back in 1981. The applications for my two DeSoto plants precede either Builders or Holiday by two years. I was pumping snad within two months after being granted a permit. They still have not pumped nor do I know if they have plans. I have had the zoning ready for the permit application at river mile 36, which I applied for in 1983, but still have not obtained it. I am ready to pump and have been for some time. On a first come, first serve basis or even on a necessity basis, both of my permit applications should have been granted over Holiday's and Builders' in DeSoto.

In closing, the real travesty of these 12 years is that I have been the only producer ont he Kansas River whose production has been limited. In fact, my total production in Lawrence and DeSoto has been limited. Under these circumstances, I am requesting the granting of my permit at river mile 36 west of DeSoto on par with my other DeSoto permit.

Sincerely,

Dave Penny

Dave Penny
President

DP:cp

cc. Robert Smith
Permits Div.

CORPS RESPONSE TO COMMENTS

3 Comment is noted.

4 Refer to response 2, above.

5 Implementation of the Regulatory Plan is expected to occur early in 1990. At that time all existing permits authorizing commercial dredging activities on the Kansas River will expire. Permits issued after implementation of the Plan will be subject to termination if a second party requests authorization to dredge in an inactive permitted reach and if dredging has not occurred in that reach for a reasonable period of time.

6 Refer to response 2, above.

7 Refer to response 2, above.

KAW SAND COMPANY
DREDGING CONTRACTORS
P. O. BOX 554 LAWRENCE, KS 66044
(913) 843-0714

February 8, 1989

Col John Atkinson
U.S. Army Corps of Eng.
Kansas City District
706 Federal Bldg.
601 E. 12th Street
Kansas City, MO 64105

Re: Kaw Sand Co. Lawrence River Permit

Dear Col. Atkinson:

With the imminence of a new management plan, I have two requests concerning my Lawrence permit. As background for these I would like to review the history of this permit.

My grandfather, Mr. M.N. Penny, had a sand operation here in the 1930's and 1940's. Through some arrangement with Mr. Jackman, who produced sand upstream below Bowersock Dam, my grandfather agreed to discontinue his operation and to buy sand from him. However, the Jackman operation was acquired by a competitor and largely discontinued. This present permit was then applied for by my brother and my father for Penny Ready Mix in 1975.

What had been done up until then was a straight forward procedure for river permits turned into a nightmare. The process took over two years; a lot of meetings and studies; and a lot of lost money and time as the equipment just sat on the bank. Finally, we were granted a very limited permit of 150,000 tons per year. Lawrence Sand Company, the owner of the unused Jackman site, was limited also to 150,000 tons per year.

Lawrence Sand Company never produced more than 1000 tons over a four year period. They later abandoned their site and I, under the name of Kaw Sand Company, applied and obtained their permit from the State of Kansas. Then, to my consternation, the Corps of Engineers eliminated the 150,000 tons per year of the Lawrence Sand Company permit. The increased length helped but the previous 300,000 tons per year total was reduced to 150,000 tons. Some of the studies done by the Corps show that river operations below 250,000 tons per year are not economically feasible. The reduction was arbitrarily low and certainly discriminitory because no one else to this day has pumped on a limited permit on the Kansas River. Several producers have had limited permits but have never used them.

CORPS RESPONSE TO COMMENTS

17. Kaw Sand Company
February 8, 1989

1 Comment is noted.

2 Bowersock Dam was constructed in 1872 and was enlarged in 1926. Complete construction details of the dam are not available; however, the Kansas City District's investigation of its construction indicates that part of the north half of the dam is supported by wooden cribbing and that the north abutment may be constructed over a base of willow mats. Therefore, stability of the structure's foundation is questionable. The dam's potentially unstable foundation condition is compounded by downstream riverbed elevations which are considered marginally adequate to prevent sliding failure of the structure. Since the dam acts as a riverbed control its failure could induce severe riverbed degradation, bank erosion and channel widening for many miles upstream. Based on all available information the Kansas City District has determined that the annual extraction of sand and gravel downstream of the dam (Bowersock Dam to river mile 48.0) will be limited to 150,000 tons to minimize potential impacts to the structure. Therefore, no increase in this limit is considered appropriate.

The new proposed plan essentially eliminates this permit I obtained from Lawrence Sand Company. The Plan permits no dredging 3000 feet downstream of the Bowersock Dam and no dredging 500 feet upstream of the 8" sewage main across the river. That leaves only about 600 feet to dredge in or a total of 40,000 tons without making in sand. The sand only makes in at 50,000 to 60,000 cps flows at this location. Presently we can dredge within 900 feet of the dam and a dry year would require that many feet to get enough sand.

The concerns about Bowersock are hard to quantify. Because of my dredging, I do not want to have it fail. However it appears certain that the effects fo dredging can not reach upstream to Bowersock. There is a coffer dam-like structure made of large stones that it across the river from the power plant to the north bank. It is at least 150 feet wide and has a rock island in the center. At flows below 1500 cps it dams the flow north of the rock island and forms a kind of rapids on the south side. The stones that form this structure and the rock island appear to be the large rubble dumped below the dam to keep the river from undercutting the dam. However, the floods carried this material 300 to 500 feet downstream and formed this rock island and the low level coffer dam that is the full width of the river. Any bed degradation can not get past this formible structure.

In light of the above, I have two requests. One is to keep the boundaries of our Lawrence permit the same as it is now. The second is to get the production limits up to par with the other proposed limits in the range of 250,000 to 300,000 tons per year. I have had to work under economic duress for over 12 years and to turn down a lot of jobs because of the 150,000 ton limits.

Thank you for your time concerning this matter.

Sincerely,

David Penny, Pres.
Kaw Sand Company

DP:cp

cc. Robert Smith
Permits Div.
Corps of Engineers

CORPS RESPONSE TO COMMENTS

3 The 3,000-foot-long undredged zone, downstream of Bowersock Dam, presented in Section VII.A. of the draft Dredging Restrictions in the Regulatory Plan has been changed to a 2,250-foot-long undredged zone in the final Plan. This change will increase the length of the reach of river available for dredging, between the dam and the upstream limit from the City's 8-inch sewer line, from 750 feet to 1500 feet. The change is based on information provided to the Kansas City District by the Kaw Sand Company that a 1,500-foot-long reach of river is required in order to obtain approximately 150,000 tons of material (10,000 tons per 100 linear feet of river channel) during relatively dry years which result in extended low flows and minimal sand movement over the dam. The change is consistent with the intent of the Regulatory Plan, since it is expected to have a minimal impact on the stability of Bowersock Dam; however, no additional encroachment into the reach of river located immediately downstream of the dam is considered feasible, if the integrity of the dam is to be maintained.

4 The length, width, thickness and uniformity of coverage of the armoring located downstream of Bowersock dam is unknown. The ability of the armoring to protect the dam from the affects of severe headcutting, precipitated by dredging activities located downstream of the structure, is questionable. The 150,000 ton annual extraction limit described in response 2. above and the 2,250-foot-long undredged zone described in response 3. above are considered by the Kansas City District to be the minimum requirements necessary to ensure that dredging activities located in the reach of river immediately downstream of the dam do not significantly impact the integrity of the structure.

5 Refer to responses 2. and 3. above.

KAW SAND COMPANY
DREDGING CONTRACTORS
P. O. BOX 554 LAWRENCE, KS 66044
(913) 843-0714

April 4, 1989

Col John Atkinson
U.S. Army Corps of Eng.
Kansas City District
706 Federal Bldg.
601 E. 12th Street
Kansas City, MO 64105

Re: Misc. Problems in Regulatory Plan for Kansas River

Dear Col. Atkinson:

Several questions have not been addressed in the regulatory plan that seem vital to its implementation. First of all, is the cost of the monitoring costs to be carried by the producers? The Corps has never come up with a dollar figure for this. Conservatively, to fly the aerials, establish a few new monuments and to do the cross sections will cost about $5,000 a mile. This does not include the extra sets of water surface profiles. More importantly, it does not represent any of the costs to obtain easement rights for the monuments, both new and old. Those could be monumental, especially in legal fees. Easily the costs could be $250,000 every two years even if the lower 10 miles is dropped and the easements cost were negligible. It appears that any plan needs to have a cap on these costs and that the time duration between the monitoring aerials and cross sections be no shorter than every four years. 1

Secondly, there is a question of the reject material and its disposal. With the production severely limited, producers will only be saving the higher dollar sand and gravel products. The rest of the material will need to be returned to the river so that it does not count against the producers quota. How can this be done in a manner acceptable to other regulations? Will discharge permits need to be obtained? The regulatory plan does not address this problem. 2

Thirdly, As owner of the river bed and islands of the river, the State of Kansas may take material from the river for fill jobs. How will this affect the two foot degradation and production limitations under the 10 mile/500,000 tons per year rule? Again, the plan has no clear guidelines. 3

Thank you for your time concerning this matter.

Sincerely,

David Penny

David Penny, Pres.

DP:cp

CORPS RESPONSE TO COMMENTS

18. Kaw Sand Company
April 4, 1989

1 All costs associated with the collection of monitoring data are the responsibility of the sand and gravel producers. The first and second paragraphs on the first page of the Monitoring Program in the draft and final Regulatory Plan state that data required to monitor dredging impacts must be collected by the producers on a routine basis and that such data must be provided to the Kansas City District, for its evaluation, to ensure that the established maximum acceptable level of impacts will not be exceeded. The number and frequency of cross-section and water surface profile collections have been reduced in the final Regulatory Plan in an effort to reduce monitoring costs. No additional reductions in monitoring data requirements are considered feasible, if reliable monitoring of dredging impacts is to be achieved. Therefore, no cap will be placed on the cost of collecting monitoring data needed to evaluate dredging impacts.

2 The Kansas City District has not received any indication from other producers that they intend to return certain fractions of sand and/or gravel to the river. The return of material to the river would require authorization from the Kansas City District under Section 404 of the Clean Water Act. A request for such work would be evaluated on a case-by-case basis and will not be addressed in the Regulatory Plan, since few if any requests are anticipated.

3 The Kansas City District has not received any indication from the state of Kansas that it intends to remove sand and/or gravel from the river for use as fill material. However, if a request would be received and if the Kansas City District authorizes such work the work would normally be subject to all of the restrictions presented in the Regulatory Plan.

KAW SAND COMPANY
DREDGING CONTRACTORS
P. O. BOX 554 LAWRENCE, KS 66044
(913) 843-0714

April 4, 1989

Col. John H. Atkinson
Reg. Functions Branch
Kansas City District
Room 706, Fed. Bldg
601 E. 12th Street
Kansas City, MO 64105

Re: Kaw Sand Co., Lawrence Plant

Dear Col. Atkinson:

This is a second letter about our Lawrence Plant. Some of the comments will be the same as a previous letter but the perspectives are different after our meeting with Bob Smith on March 16 in Lawrence.

Several of the proposals in the management regulatory plan essentially eliminate our Lawrence operations as I previously mentioned. The 3000 feet limit downstream from Bowersock and the 500 feet upstream from the 8 inch sewage main leave us with only 400-500 feet to dredge in. Our present permit allows us to dredge downstream of Bowersock to within 900 feet. The dam is protected by a large heavy rock bar all across the river just below the dam. It prevents the affect of downsteam dredging from reaching the dam.

The narrowness and shallowness of the river gives us a limited supply of sand even dredging to within 900 feet of the dam. In a dry year, we need to use nearly the whole stretch upstream from the sewage main to this 900 feet downstream of the dam. We could probably live with a limit of 1200 feet downstream from the dam; anything more does not leave us enough sand to work with.

Also, I would like to request an increase in our production limit. The Corps' studies showed and we have experienced that it is nearly impossible to operate an operation with a production less than 250,000 tons per year. In light of this, I would like to request a production limit comparable to the other permits of 250,000 tons per year.

In summary, I am requesting a production limit of 250,000 tons per year and an upper dredging boundary no further than 1200 feet from Bowersock Dam.

Sincerely,

David Penny

David Penny, Pres

DP:cp

CORPS RESPONSE TO COMMENTS

19. Kaw Sand Company
April 4, 1989

1 Refer to responses 3. and 4. to Kaw Sand Company's February 8, 1989 (17) letter.

2 Refer to response 3. to Kaw Sand Company's February 8, 1989 (17), letter.

3 Refer to response 2. to Kaw Sand Company's February 8, 1989 (17), letter.

4 Refer to responses 2. and 3. to Kaw Sand Company's February 8, 1989 (17), letter.

KAW SAND COMPANY
DREDGING CONTRACTORS
P. O. BOX 554 LAWRENCE, KS 66044
(913) 843-0714

April 4, 1989

Mr. John Atkinson
US Army Corp of Engineers
KC District
706 Fed Bldg.
601 E. 12th Street
Kansas City, MO 64105

Re: Regulatory Plan, Kansas River

Dear Col. Atkinson:

I have enclosed a few more comments on the regulatory plan. First of all, after talking to several dredgers, it seems (with the exception of a couple) that the phase-in time should be as short as possible. I would prefer, as do most of the dredgers, no phase-in time since we have none. This would get the river and the market on the fast track to equilibrium. It would conserve sand particularly in the lower reaches. It would prevent a discrepancy between a base line on the river degradation in 1990 and the actual production if the production limits were implemented also in 1990 instead of 3 years later. In any case a phase-in time of more than 3 years is unesireable. 1

Secondly, I think that the 10 miles/500,000 tons rule should remain as per present plan. Several have suggested making it 15 miles/750,000 tons but that can lead to higher concentrations in shorter reaches. 2

Thirdly, I think that the 300,000 tons/plant rule should be fixed except for an exceptional, short-term situation. Certainly it should not be granted on a year-after-year basis. 3

Fourth, no permit should be continued that is not used within one year after it is issued. A clear case is at DeSoto where two permits have been granted but not used in over two years. No one should be allowed to sit on a permit if others want to work in that reach. The rule should be use it or lose it. 4

Fifth, the cost of the monitoring plan appears to be astronomical. A dollar value must be fixed in the plan. Several of the monitoring rules could be set to the same conditions so that they could be run at the same time. For instance, the cross section and river level profiles should all be set to say 6000 cfs or less. As it is, the cross sections are 10,000 cfs or less and two sets of water level profiles are at 5000 cfs and 1500 cfs respectfully. Also, an option should be made to do the water profiles with ariel telemetry to cut costs. Lastly, the monitoring should be extended to four years with a two year grace period to shut down if the fixed degradation is exceeded. The length then of the monitorings could spread that cost out. 5

CORPS RESPONSE TO COMMENTS

20. Kaw Sand Company
April 4, 1989

1 Refer to response 1. to Holliday Sand And Gravel Company's January 30, 1989, letter.

2 Refer to response 4. to Holliday Sand And Gravel Company's January 30, 1989, letter.

3 Refer to response 4. to Holliday Sand And Gravel Company's January 30, 1989, letter.

4 Refer to response 5. to Kaw Sand Company's February 8, 1989 (16), letter.

5 Refer to response 1. to Kaw Sand Company's April 14, 1989 (18), letter for a discussion of monitoring costs. Channel cross-section surveys must be collected when river flows are 10,000 cfs or less, therefore, the collection of cross-section surveys could be performed in conjunction with the collection of water surface profile data at either 5,000 or 1,500 cfs. The 5,000 and 1,500 cfs water surface profile data collections can not be reduced to 1 data collection, since each data collection will provide essential monitoring information. The 5,000 cfs data collection will provide water surface profiles when flows are near the river's mean average. The 1,500 cfs data collection will provide

5

Last of all, the regulatory plan has no provision for extraordinary conditions such as dry cycles where more degradation may occur because extraction may exceed deposition. Likewise, the plan makes no provisions for its modification to allow increased production with accreation of the river bed

6

Sincerely,

David Penny

David Penny, Pres.

DP:cp

CORPS RESPONSE TO COMMENTS

water surface profiles in the river's low flow channel (thalweg) during low flows. The Kansas City District believes that the collection of water surface profile data using aerial telemetry would be substantially more expensive than using conventional survey equipment. If aerial telemetry is used additional bench marks would be required along both riverbanks to provide a sufficient number of flagged reference points. Refer to response 3. to Holliday Sand And Gravel Company's January 30, 1989, letter for a discussion of the number and frequency of monitoring data collections. Refer to response 1. to Holliday Sand And Gravel Company's January 30, 1989, letter and response 1. to Holliday Sand And Gravel Company's April 14, 1989, letter for a discussion of implementation of the Regulatory Plan.

Refer to responses 2. and 5. to Holliday Sand And Gravel Company's January 30, 1989, letter.

KAW SAND COMPANY
DREDGING CONTRACTORS
P. O. BOX 554 LAWRENCE, KS 66044
(913) 843-0714

April 4, 1989

Col John Atkinson
US Army Corp of Eng.
KC District
106 Fed Bldg.
601 E. 12th Street
Kansas City, MO 64105

Re: Kansas River: Conditions in Regulatory Plan relating to the Two Foot Degradation.

Dear Col. Atkinson:

In our discussions on the regulatory plan two points seem to be hard and fast. One is the two foot limit in degradation. The second is a target sand extraction of no more than 1.7 million tons a year below Bowersock dam.

As far as the two foot degradation, this seems to be based on an economic basis of monetary damage per foot of degradation. However, this corelation does not appear per se in any of the Corps studies. Simons and Li try to relate extraction rates to degradation. Also a couple of places refer to economic damages to the Sunflower Ordinance intake, the Johnson County Water District intake, and the water well fields. However these do not give a quantitative monetory damage per foot of degradation. This correlation of dollars to degradation seems to be based on unpublished Corps studies. If the regulatory plan with its massive economic impacts is based on this two foot degradation, I feel that it should be available for examination and comment before the finalization of the plan. I feel that the whole plan is based on these unpublished and unavailable studies.

I do not even know what is impacted. Are the dollar values applied to bank erosion, pipelines, well fields, bridges, or other structures? Do the studies take in account the depreciated values of the structure? Is damage caused by the river with zero degradation subtracted from the two or five feet degradation damages? Who did the studies, what were their sources, what are their qualifications? We are being held to a two-foot degradation with no study before us to examine for its validity.

CORPS RESPONSE TO COMMENTS

21. Kaw Sand Company
April 4, 1989

1 Refer to the Corps of Engineers April 14, 1989 response (Appendix C, Letters of Coordination - Dredgers) and also Kaw Sand Company's April 17, 1989 letter and Corps response.

2 Refer to response 1, above.

Another problem aside from the validity of the two-foot limit is its application in a phased application of the production limits. According to the regulatory plan, the baseline crossection and water levels for the two-foot degradation are established on 1990. However the production limits on several of the operations will be phased in over three years. The high produtions in 1990, 1991, 1992 in the Bonner Springs area before the full application of the limits could further degrade the river bed and water level there. This could undermine the this [redacted] armour bottom upstream since it has sand under it. This in turn would degrade the bed in the DeSoto reaches. Either there should be no phase-in period or the baseline for the two-foot degradation upstream should be when the production limits are fully implemented downstream in 1993. 3

The target of 1.7 million per year extraction below Bowersock dam deserves some comment. First of all, this is only about 40 percent of the present production levels. Or in the reverse this plan eliminates 60% of the present supply. This 1.7 million is the extraction rate under optimum conditions. One million tons of the total are below Bonner Springs. The production above Bonner Springs given the 10 mile/500,000 tons rule will be fortunate to yield the 700,000 additional tons per year. Only under optimum conditions will the 40 percent of present condition be produced. Now throw in road access, site plant options, and zoning problems. These could easily eliminate another 500,000 tons per year. Add to this a dry weather cycle as we currently may be in. The two-foot degradation will eliminate dredging at least temporarily above Bonner Springs. Likewise, the production below Bonner Springs will be significantly reduced. Together these could easily reduce the sand production to one-fifth of its current levels. Given that the demand for sand is fixed, the question is not one of price but of availability. A break of a vital link in society like sand works havoc. A 25 percent decrease in the oil supply in the early 1970's is a good example of that. The regulatory plan is fixed to limits which under maximum permited production will produce serious long range impacts. 4

I have three requests:

1. the studies for the monetary damage versus river bed degradation which determined the two-foot limit and time to study and to comment on them before the end of the comment period, 5
2. a change of the baseline conditions for any degradation limits from 1990 to 1993 when the production limits are fully implemented, 6
3. alternative plans to guarantee that sand production does not fall below the 1.7 million tons per year limit especially in the sections above Bonner Springs. 7

Sincerely,

David Penny, Pres.

DP:cp

CORPS RESPONSE TO COMMENTS

Dredging operations have been located in the reach of river between Bonner Springs and the river's confluence with the Missouri River for many decades. These operations are typically large, and may have annual sand and gravel extraction rates of a million tons or more. Due to the length of time that these operations have been on the river and due to there relatively large size the Kansas City District has determined to phase them into compliance with the Regulatory Plan over a period of 3 years. The Kansas City District has also determined to initiate the collection of base line monitoring data immediately upon implementation of the Regulatory Plan. Any delay in the collection of base line data could result in the occurrence of unacceptable dredging-related impacts to the river's morphology and ecology and to nondredging interests located in and along the river, due to excessive riverbed degradation.

The final Regulatory Plan does not limit the annual extraction of sand and gravel from the lower river to 1.7 million tons. The Plan allows: (a) the removal of 1 million tons of material annually from the reach of river located downstream of river mile 21.2; (b) the removal of 750,000 tons of material annually per 15-mile-long reach of river between river miles 21.2 and 48.0; and (c) the removal of 150,000 tons of material annually between river mile 48.0 and Bowersock Dam. Theoretically, approximately 2.5 million tons of material could be removed from the lower river annually, if road access, zoning and other similar problems could be resolved. The restrictions presented in the Regulatory Plan to limit the annual extraction of sand and gravel from the lower river are considered by the Kansas City District to constitute the maximum allowable rate of extraction, if impacts are to be kept at an acceptable level. Therefore, no increase in the annual extraction limits set for the lower river is considered feasible.

Refer to the Corps of Engineers April 14, 1989 response (Appendix C, Letters of Coordination - Dredgers).

Refer to response 3, above.

Refer to response 4, above.

KAW SAND COMPANY
DREDGING CONTRACTORS
P. O. BOX 554 LAWRENCE, KS 66044
(913) 843-0714

April 17, 1989

Col. John H. Atkinson
Reg. Functions Branch
Kansas City District
Room 706, Fed. Bldg
601 E. 12th Street
Kansas City, MO 64105

Re: Kansas River Degradation Costs, River miles 8.2-50.2

Dear Col. Atkinson:

I would like to address the potential impacts from continued dredging to structures on the Kansas River.

WELLS

The well replacement costs are nearly the same for 1 foot or 5 feet of degradation costs on all the well fields. The need for well replacement is more a function of well use, age, and failure than river elevation. The annual pumping costs are relatively small and vary more with river stages due to the total rain fall in the basin than degradation due to dredging. 1

WATER INTAKES

The river degradation at Johnson County Water District No. 1 Intake is very unlikely to degrade further. The repair because of the coffer dam construction will be constant, dredging or no dredging. The Sunflower AAP Water Intake has not been used in 15 years. Any plan to use this facility again will involve costs not attributed to river degradation caused by dredging. To place any potential cost to river degradation at these two facilities in the future is not a seerious consideration. One is inoperable and the other can not experience any more degradation of the river bed due to dredging. 2

CORPS RESPONSE TO COMMENTS

22. Kaw Sand Company
April 17, 1989

This letter provides comments on information provided to Mr. Penny by the Corps of Engineers on April 14, 1989. This information was requested by Mr. Penny in his letter of April 4, 1989. See Appendix C, Letters of Coordination - Dredgers, for the April 14, 1989 Corps of Engineers letter. It should be noted that the Corps of Engineers has not conducted a formal economic study in an attempt to quantify all past, present, and future economic impacts associated with commercial dredging activities on the Kansas River. Due to the vast number of structures and facilities located on or adjacent to the Kansas River along with the vast complexities in accessing economic impacts (existing), it was not possible to do a formal all encompassing economic study. The Corps of Engineers did investigate the most significant economic impacts, in terms of the public interest, on such aspects as bridges, pipelines, well fields, water intakes, and bank stabilization structures. These are the costs included in the April 14, 1989 Corps of Engineers letter. The Corps of Engineers has decided that non-dredging interests should not have to pay for impacts resulting from the existing dredging operations.

The information on wells is taken from the 1986 Report on Kansas River Valley Groundwater Impact Investigation (Burns & McDonnell, 1986) which has previously been provided to the dredgers. This report addresses various alternatives including costs to mitigate lost well field capacity that would result with various levels of riverbed degradation. It is a fact that riverbed degradation does result in the lowering of adjacent groundwater levels which, in turn, results in higher pumping heads and increased power costs to well field operators. In some case, actual well yield can also be reduced.

The information on the water intakes is taken from the 1986 "Report on Kansas River Water Intake Investigations" (Burns & McDonnell, 1986) and the "Recommendations for a Plan to Regulate Commercial Dredging on the Kansas River" (Simons, Li, and Associates, 1985) both of which have previously been provided to the dredgers. Additional channel degradation is not expected immediately upstream of the Water District No. 1 intake. Because the problems of channel degradation occurred early in the life of the intake, the solutions to the problems of channel degradation have essentially already been implemented. However, substantial degradation is expected immediately downstream of the weir. This degradation, combined with local scour and movement of stones during large flood events, could seriously endanger the stability of the structure. Periodic monitoring and continued rock fill placement will be required by the Water District to assure the structural integrity of the facilities. The costs contained in the letter of April 14, 1989 did not include $40,000 which is required for normal maintenance on the existing jetty and low flow weir. The Sunflower AAP water intake is currently deactivated, however, it is to be restored if a national emergency should occur which would require increased production at the Sunflower ordnance works. This intake is located in a reach of river susceptible to additional degradation under existing dredging conditions (See page EIS-44).

PIPELINE CROSSINGS

The twopipeline crossings are at River miles 14.65 and 16.5. Both are presently exposed and suspended. The capital costs are not based on future degradation. To include them in future degradation costs potentials is unfair. The reaches where they are found are unlikely to degrade further. They should not have been included in potential impacts.

3

As indicated in the enclosures with the April 14, 1989 letter, the pipeline crossing at river mile (RM) 14.65 was stabilized with grout bags in 1988 for an estimated cost of $144,000. This crossing is in the reach of river which is the most susceptible to degradation under existing conditions (see page EIS-44). The pipeline crossing at RM 16.5 is also in a reach of river susceptible to degradation under existing conditions (see page EIS-44).

RAILROAD BRIDGES

First of all, I would be curious at what these two bridges (river miles 21.2 and 83.7) are carried as appraised values on the tax rolls. The enclosed letter from the Santa Fe of July 7, 1981 states that the repairs made in 1975 were a permanent fix for the 21.2 mile bridge. Both bridges are old enough to be replaced and have certainly been depreciated out. To attribute needed repairs to river degradation particularly at Topeka is unwarranted. Old river bridges in sand river beds are constantly in need of repair particularly near the center supports and end abuttments.

4

These bridges are relatively old (both designed in 1938) but this does not imply that they are no longer of any value. Both are still structurally sound and are still in use. The July 7, 1981 letter does state that the previous repairs to the Bonner Springs bridge are "considered a permanent solution to the problem." However, in a more recent letter of April 2, 1986 (See page C-25 of the EIS) the Atchison, Topeka and Santa Fe Railway Company stated that they believe "for permanent protection on a long term basis"..."that there would be a need to drive additional interlocking steel sheet piling around all six piers, including the three which already have such protection". In addition, they state that "the Topeka bridge is not yet in an endangered position as is the Bonner Springs bridge, apparently, since dredging operations are not now taking place as close down stream as is at the Bonner Springs location. In time, the Topeka bridge also will need to be given protection to foundations to offset the degrading of the river stream bed." The Topeka bridge is in a reach of river susceptible to degradation, however, this degradation potential is less than that found in most reaches of the lower Kansas River.

EROSION

The erosion potentials can be significant regardless of dredging. The difference between zero and five feet degradation is negligible.

5

No single factor is solely responsible for the erosion potential. However, it is a fact that riverbed degradation, which can result from excessive dredging, does increase the erosion potential.

BANK STABILIZATION STRUCTURES

This is the big item on potential impact versus bed degration. First of all, the calculations are carried out between river miles 8.2 and 50.4. Because of the Missouri River back waters there will probably very little degradation below the Johnson County Intake Dam at river mile 15. This dam also creates a back water effect up to the Santa Fe railroad bridge at river mile 21.2. So any bank stabilization structures in the stretch between 21.0 to 8.2 should not be included in the potential impacts due to degradation. In fact the regulatory plan considers such degradation so low a possibility below Bonner Springs that it has no regulations related to degradation below Bonner Springs. The potential dollar impacts should only be considered above river mile 21.2. This would cut the dollar values probably in half.

6

Although the Missouri River backwater may sometime extend to river mile 15, it generally extends only to river mile 9. The reach of river between miles 9 and 15 would be subject to degradation. In addition, degradation could also occur within the backwater of the weir at river mile 15 if dredging is concentrated in that area. It should be noted that the reach of river downstream of Bonner Springs is subject to the same 2 foot limit on degradation as is the rest of the Kansas River.

Secondly, the riprap costs are based on .6 ton/foot of degradation for large riprap and .5 ton/foot for small riprap. Generally the riprap moves down with degradation and the riprap is not lost nor is more needed. Also, for a five foot degradation a total of 3 ton/foot of structure length is estimated needed due to degradation. Generally, a total of 5 tons/foot of structure length is adequate for bank stabilization. In other words the 3 tons/foot for a five feet degradation is grossly over estimated.

7

The estimated stone replacement was based upon "equal" bank stabilization to the same height on the bank after channel degradation. Although the lower bank may be stabilized by the existing stone after degradation, there may be some portions of the upper bank subjected to potential scour during high flows. In addition, the quantities calculated for stabilizing eroding banks on the Kansas River are considered only marginally adequate for assuring no erosional damage of the river bank due to channel degradation.

Thirdly, the cost of $20 per ton used in the study to buy and place riprap is much too high. Ten ($10) a ton is a much more realistic cost of the riprap in place. This alone would cut the cost estimates in half. 8

SUMMARY

This is a summary for a five foot degradation in river miles 21.2-50.2 since the regulatory plan sees little or no degradation below 21.2 at Bonner Springs.

1. Wells - $25,000
2. Water Intakes - Johnson County- no further degradation in stretch
   Sunflow AAP - Non operational since 1973
3. Pipelines - No further degradation in pipeline areas
4. Railroad bridges - no further degradation at river mile 21.2
5. Erosion - no significant cost due to degradation
6. Bank stabilization structures - approximately $1,000,000 capital cost

COSTS FOR FIVE DEGRADATIONS

1. Annual costs (wells) - $25,000.
2. Capital Costs (bank stabilization) - $1,000,000.

Sincerely,

David Penny

David Penny, Pres

DP:cp

CORPS RESPONSE TO COMMENTS

The $20.00 per ton estimated cost for rock placement was based on actual bids recently received by the Kansas City District for similar bank stabilization projects.

B.S.C. Holding, Inc.
4919 Lamar Avenue • Mission, Kansas 66202
(913) 262-7263

March 6, 1989

Colonel John H. Atkinson, District Engineer
Kansas City District
U. S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Re: Draft Regulatory Plan -
Kansas River

Dear Colonel Atkinson:

Due to circumstances revealed by your staff on March 6th, we feel it is necessary to extend the comment period 30 additional days in order to accumulate additional data to support our concerns with the draft regulatory plan proposed by your office.

We formally submit a request to extend the comment period until April 15, 1989.

Please respond immediately, since the current comment period expires March 15th.

Sincerely,

Peter Powell
President

PP:nd

cc: Kevin M. Dempsey
Woody Moses
Bory Steinberg, CECW-R

CORPS RESPONSE TO COMMENTS

23. B.S.C. Holding, Inc.
March 6, 1989

1 Concur. The comment period was extended until April 17, 1989.

B.S.C. Holding, Inc.
4919 Lamar Avenue • Mission, Kansas 66202
(913) 262-7263

March 7, 1989

Colonel John H. Atkinson, District Engineer
Kansas City District
U. S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Colonel Atkinson:

The following letter is in response to the proposed Regulatory Plan and the draft copy of the Environmental Impact Statement your staff released in January concerning the area of the Kansas River which falls under your jurisdiction (Rivers and Harbours Act of 1899).

You have been mailed a letter from the lower Kansas River producers (January 30, 1989), of which we are one, which states the joint concerns about the draft copies.

This letter seeks to add additional comments to the letter sent by the producers from two companies we currently own and operate on the Kansas River -- Victory Sand and Gravel, Inc. in Topeka, Kansas and Builders Sand Co. of Kansas City.

As a sand and gravel producer on the Kansas River for almost 50 years, our company has dealt with the changing composition and course of it daily. As it is our sole means of maintaining our jobs and our future, the impact this report has is significant. Our comments on both the EIS (Environmental Impact Statement) and draft Regulatory Plan is based primarily on our experience as well as response studies performed by Dr. Smith of the University of Kansas. We trust that you will consider our concerns and comments carefully before reaching a final determination about the future of the Kansas River.

COMMENTS ON THE ENVIRONMENTAL IMPACT STATEMENT

The EIS was a limited investigation into the effect of dredging on the morphology and ecology of the Kansas River. We use the word "limited" because it has been our belief that the causes of changes on the river are due to more than the effects of dredging. If the EIS encompassed the impacts of water usage, upstream reservoirs, the Missouri River, and structures, we believe the government's money would be better spent, and the answers more conclusive. Instead, the statement falls short of responding to the requirements set forth by the EPA regarding the issuance of permits for all activities on the Kansas River.

CORPS RESPONSE TO COMMENTS

1 The letter referred to in this comment is the January 30, 1989 letter from Holliday Sand and Gravel Company addressed earlier in this section.

2 Comments are noted.

3 This issue has been addressed in previous studies. See the "Areas of Controversy" section of the "Summary" chapter in the EIS for additional information.

Demands for water in and around the Kansas River basin is growing annually. With the future growth that will result in the area, especially in Wyandotte, Johnson, Leavenworth, Douglas, Jefferson and Shawnee Counties, water resources will be an issue. If this demand for water is impacting the water table, dredging would be affected.

4

The upstream reservoirs, and the release of water from them, has been an issue which we believe was never fully investigated by your staff. It is impossible for us to agree with your position that the reservoirs have not had any significant effect on the Kansas River. The reservoirs now hold back more than 80 per cent of the water which use to flow naturally into the river. It seems to follow that when releases from the reservoirs in patterns inconsistent with the normal flow, changes in the morphology of the river will occur. These changes would include the ability of the river to carry sands and gravels downstream to replenish dredged areas, and rising water levels sufficient to feed the surrounding fawna and water tables.

5

CORPS RESPONSE TO COMMENTS

The point of this comment is not clear. At present, it is not known how increases in the demand for water will impact the water table in this area and impacts to dredging are not anticipated at this time.

In 1983 the Kansas City District contracted Simons, Li, and Associates to prepare a report entitled, "Analysis of Channel Degradation and Bank Erosion in the Lower Kansas River." The report was prepared to provide a quantitative analysis of bed degradation and bank erosion in the lower Kansas River which may be the result of natural occurrences, commercial sand and gravel extraction, modification of the flow regime and sediment transport rates by Federal reservoirs, the navigation channel and bank stabilization development on the Missouri River, and other activities of man on the Kansas River. The report indicates that the Federal reservoir system in the Kansas River basin has had a minimal impact on riverbed degradation and bank erosion in the lower river. The report states that sand and gravel dredging appears to be the primary cause for bank erosion and channel widening in the lower 30 miles of the Kansas River and notes that sediment continuity indicates a direct relationship between dredging activities and channel degradation and bank erosion. These findings are in general agreement with the findings of the Kansas City District's 1977 draft report entitled, "Impact of Commercial Sand Dredging In The Lower Kansas River." The 1967 U.S. Geological Survey report entitled, "Kansas River, Bonner Springs To Mouth - Degradation of Channel," also examined a number of factors that could affect degradation of the river channel, which included sand and gravel removal and a change in the river's sediment load. The U.S. Geological Survey report concluded that commercial dredging activities are the primary cause of degradation in the lower 22 miles of the river. The Kansas City District does not contend that the Federal reservoir system along the Kansas River has not had an affect on the river's ability to move sand. The reservoirs have attenuated the river's high flows which has intern reduced the river's annual sand transport rate. However, there is no indication that the attenuation of high flows and the attendant reduction in the sand transport rate has had a significant affect on riverbed degradation or bank erosion. Although the sand transport rate has changed due to reservoir construction the ratio of sand transported into and out of a given reach of river has not changed significantly. The reaches of river upstream of river mile 22 have a sand input/output ratio of approximately 1:1. Therefore, the amount of sand entering a reach is approximately equal to the amount leaving a reach. The reach of river located downstream of river mile 22 does not exhibit equilibrium in its sand input/output ratio since excessive dredging in that reach has not allowed it to maintain a steady state condition. If the river's sand transport rate could be increased it would not appreciably change the potential amount of riverbed degradation that could occur in the reaches of river located upstream of river mile 22, for any given rate of sand and gravel extraction. For example, if the river's annual sand transport rate into the De Soto area would increase from the current rate of

When a dredge digs a hole in the river bottom, we realize that the material to refill it must come from upstream beds. If there is insufficient quantities of material introduced to the river to compensate for this action, the river bed will be lowered. The quantity of waterflow to achieve the motion of the upstream beds must sometimes be "bank full". Since the completion of the reservoirs,water releases are rarely bank full, thereby starving the dredge operations from new materials. By imitating natural releases into the river, the Corps could help to maintain a near similar condition to what existed before the reservoirs.

Although you are mandated by Congress to maintain the elevations of the Missouri River, which can have a bearing on the releases of water into the Kansas River, we believe more evaluation of the impacts of the Missouri River on the Kansas River was in order. In addition to the elevation control, the Missouri does have an impact on the lower reach of the Kansas River from the Johnson County Water Districts Weir (RM15.5) to the mouth from back water. The EIS did address this briefly; however, more consideration should be given to its impact on the Regulatory Plan.

CORPS RESPONSE TO COMMENTS

5

approximately 1.67 million tons annually to the prereservoir rate of approximately 2.47 million tons the amount of material leaving the reach would also increase to approximately 2.47 million tons. Therefore, if future dredging activities in the De Soto area remove 750,000 tons of sand and gravel annually the annual net material deficit within that reach would be approximately 750,000 tons, regardless of whether the annual sand transport rate through the reach is 1.67 or 2.47 million tons. An increase in the quantity of sand transported into the reach of river downstream of river mile 22 could reduce dredging related degradation in that reach. Excessive dredging of the reach has significantly deepened the river channel which has slowed flow velocities and has increased the rivers sand trapping efficiency. Currently more sand enters the reach than leaves the reach. However, if dredging activities were to cease downstream of river mile 22 the reach would aggrade until it attained a steady state condition with a sand transport input/output ratio of approximately 1:1. The Kansas City District's findings concerning the causes of riverbed degradation, bank erosion and channel widening are in general agreement with the findings of the U.S. Geological Survey and Simons, Li, and Associates. Therefore, no additional evaluation of the affects of the Federal reservoir system is considered necessary.

6

Manipulating reservoir releases to create bank full conditions in the Kansas River, especially the lower river, is not considered feasible by the Kansas City District. A detailed discussion of this issue would be to long and complex to present here. The primary concerns of the District center around the risks that such releases would present to life and property along the river. In order to create bank full conditions in the lower river substantial releases would be required from reservoirs as far away as Milford Lake. The lag time between releases at Milford Lake and their arrival in the lower river is 4 - 5 days. Therefore, if a large rainfall event would occur in the lower river's watershed during bank full reservoir releases substantial flooding could occur. It should also be noted that during drier periods of the year, when manipulation of the reservoirs would be most useful to the producers, it is unlikely that sufficient water levels would be present in the reservoirs to allow for such releases.

7

The Missouri River's backwater extends into the Kansas River approximately 9 miles during periods of normal flows in the Missouri River and upstream to the Water District No. 1 weir (near river mile 15) when Missouri River flows are extremely high. The Missouri River's backwater has a stabilizing influence on the reach of the Kansas River located downstream of the Water District No. 1 weir and especially on the lower 9 miles of the river. The stabilizing influence of the Missouri River's backwater is one of the factors responsible for the Kansas City District's decision to eliminate routine channel cross-section and water surface monitoring downstream of Turner Bridge. The Kansas City District is satisfied with its review of the Missouri River's influence on the Kansas River and does not intend to expand its review.

As to the ecological impacts reviewed in the EIS, it appears that some level of dredging would prove beneficial to the Kansas River. Although it was unclear as to exactly what level of dredging would be ideal, the study clearly showed that there are ecological benefits derived from dredging. Perhaps further analysis of this condition was in order, which would have given a better idea as to what level of dredging is best.

On the subject of flood control, little was said. However, we feel a great deal of importance should be placed on the value of dredging towards flood control. Since the upstream dams and levees were built at great expense to the public to protect it from flooding, it follows that by lowering the bed elevations of the river, additional capacity is achieved which can reduce the risk of high waters spilling into the surrounding bottoms. The cost savings of dredging were never completely analyzed, which could be significant in determining the benefits of dredging the Kansas River.

In response to the comments on land use, we felt the estimates about the number of acres that could be consumed by the pit mining was underestimated significantly, as well as the difficulty in obtaining proper permits to open such facilities. Specifically, the sixty-two (62) acre estimate for annual consumption under the "no dredging" option was unrealistic. Due to varying depth of deposits, as much as thirty feet, it is impossible to accurately calculate the total number of acres consumed. In addition, the gradation of materials found in one area can vary greatly from another, making it difficult to accurately satisfy demand for certain materials (i.e. masonry sand). In a restricted dredging scenario, some pit mining is contemplated, given the difficulty in obtaining land, applying for and receiving the proper permits, as well as constructing the plant itself, land based mining does not hold the promise your report indicates.

In summation, we believe that the draft copy of the EIS falls short of providing a comprehensive analysis of both the causes and effects of dredging on the Kansas River. After making stacks of studies over fifteen years, at great expense to the public, we believe the complete picture of what is happening to the lower reaches of the Kansas River is still not known. The areas impacted by dredging only cover about twenty per cent (20%) of the entire river. Yet, your report gives the impression that continued unrestricted dredging will result in severe impacts to the entire length of the river. Your report also leads the reader to believe that by restricting dredging, many of the structural damages could be avoided. We wish to caution you before coming to such a conclusion since the possibility of structural damage will still prevail if there is no dredging on the river. We feel that more comments on the effects of the reservoirs, the demands for water, the impact of the Missouri River, and the benefits of dredging to flood control are needed to truly complete the EIS.

CORPS RESPONSE TO COMMENTS

8 Some limited ecological benefits may result from limited dredging. However, this is dependent on how one measures ecological benefits i.e. fish diversity, sport-fish harvest, rare and endangered species, native species, etc. No ecological benefits are ultimately realized from extreme dredging as has been occurring in the recent past.

9 The increase in channel capacity resulting from dredging is very limited especially when compared to the volume of water contained in flood events on the Kansas River. In addition, this increased channel capacity may be offset by the flatter gradient that is found in degraded reaches of the river. Any flood control benefits derived from dredging is very limited and does not require additional analysis.

10 The 62 acre estimate for a pit mining operation is realistic. This estimate is based on an average depth of 32 feet for the sand deposits. This number is in agreement with the "Report on Kansas River Flood Plain Sand and Gravel Investigation" prepared by Burns and McDonnell in 1986 for the Corps of Engineers. Copies of this report were previously provided to all Kansas River dredging interests. The Corps realizes that there is variation in the depth of these deposits. However, this number is only an estimate for an average pit mining operation; some may actually require more land, some less. In addition, the Corps realizes that there may be some difficulty in establishing a pit mining operation. However, based on the large amount of suitable land for pit mining operations within the Kansas River floodplain along with the fact that pit mining operations have existed in the past in the Kansas River floodplain, and some still exist today, this is considered to be a feasible alternative source of sand.

11 It is not the intent of the EIS to provide "a comprehensive analysis of both the causes and effects of dredging on the Kansas River." Earlier reports prepared prior to developing the Regulatory Plan document that there is sound scientific support for attributing much of the past severe bed degradation, bank erosion, and channel widening on the lower Kansas River to commercial dredging. These reports are referenced in the EIS in accordance with the National Environmental Policy Act. The Corps realizes that the entire Kansas River is not impacted by dredging. Throughout the EIS there are numerous references to "the lower Kansas River" and "the Topeka area." As stated in the introduction to section V. ENVIRONMENTAL EFFECTS of the EIS; "Most impacts that are discussed in this section are concentrated in the lower Kansas River between its mouth and Bowersock Dam (Lawrence) and in the Topeka area. These two reaches are the most intensively dredged on the Kansas River." In addition, the Corps also realizes that there will still be some potential for damage even with the restrictions imposed by the Regulatory Plan.

COMMENTS ON THE REGULATORY REPORT AND REGULATORY PLAN FOR DREDGING.

The regulatory report was both a review of the past and the conclusions resulting from fifteen years of analysis of data on the Kansas River. Much of the historical review is factual, however; imbedded in these facts are opinions of the staff that wrote the report, with which we disagree. There is implied within the report a predisposition that dredging is the major source of problems on the Kansas River. One can see the way the study of the river progressed from an original belief of ecological damage to one of economic damage. It is apparent that finding fault with dredging was not easy.

11

Once it was determined by your office that structural damage to water intakes, bridge abutments and cross river pipes, the report concentrates on developing a series of controls based on assumed effects that nearby dredging "might" cause. This apparent judgement on the necessary distances, tonnages and methods of production are based on unsupported facts.

12

13

The report indicates that 1,670,000 tons of material are annually deposited into the lower reach of the river (R.M. 21.2-0.0), yet it concludes that only 1,000,000 tons of annual extraction will keep the river "in balance". It indicates that dredging between R.M. 21.2-48.0 will need to be restricted to an annual rate of 500,000 tons based on the results of the Topeka area, yet in that area annual extractions of 400,000 tons have resulted in only a one-foot drop in bed elevation over a ten-year period. If the Corps is attempting to limit bed degradation to two feet per year, more than 500,000 tons could be pumped out and still keep the river "in balance". The report states that bed degradation must be limited to two feet per year, yet the State of Kansas Highway Department indicates an allowable five feet will preserve their bridges, and the Simons and Li study (on which much of these conclusions are based) even gives a two to five foot allowance. Apparently your staff has a better understanding of allowable degradation beyond these interests.

14

CORPS RESPONSE TO COMMENTS

However, this potential will be significantly less with the restrictions than under the existing conditions. It is the Corps position that non-dredging parties should not have to pay for damages resulting from excessive dredging as is presently occurring on the lower Kansas River. These damages should be minimized with implementation of the Regulatory Plan.

The Kansas City District's position that commercial dredging activities on the Kansas River are the primary cause of riverbed degradation, bank erosion and channel widening in the lower river is based on over a decade of examining the issues and is supported by the findings of the U.S. Geological Survey's 1967 report entitled, "Kansas River, Bonner Springs To Mouth - Degradation of Channel" and the Simons, Li, and Associates' 1984 report entitled, "Analysis of Channel Degradation and Bank Erosion in the Lower Kansas River."

The restrictions incorporated into the Kansas City District's Regulatory Plan are based on Simons, Li, and Associates report entitled, "Recommendations for a Plan to Regulate Commercial Dredging on the Kansas River;" an examination of the impacts associated with existing and past dredging operations on the river; and on the combined experience of the Kansas City District's staff.

Approximately 1.67 million tons of sand is transported annually into the reach of river downstream of mile 21.2. However, some of that material is transported through the reach and into the Missouri River, as stated on page 15 of the draft Regulatory Report. Therefore, some quantity of sand less than 1.67 million tons is trapped in that reach annually (refer to response 2. above for a discussion of sand transport rates and sand trapping efficiency). The Regulatory Plan limits the average annual rate of sand and gravel extraction between river miles 21.2 and 48.0 to 50,000 tons per mile, not 500,000 tons for the entire reach. (The draft Plan limited the annual rate of extraction to 500,000 tons of material per 10-mile-long reach of river. The final Plan limits the rate to 750,000 tons per 15-mile-long reach.) The Plan limits riverbed degradation to an average of 2 feet for any 5-mile-long reach of river, not 2 feet per year (refer to Section 1. of the Regulatory Restrictions in the Regulatory Plan). The 50,000 ton average annual extraction limit per river mile is intended to slow the rate of riverbed degradation in order to allow the river channel a reasonable period of time to adjust to declining riverbed elevations, which in turn will reduce potential adverse impacts associated with such degradation. The 2-foot average limit for riverbed degradation is considered by the Kansas City District to be the maximum allowable amount of degradation compatible with the overall public interest involved. The Public interest includes economic impacts to nondredging concerns, environmental impacts and morphological impacts (refer to the Regulatory Report for a discussion of such impacts).

With regard to allowable distances that dredging can occur from certain structures, there are many inconsistencies. We disagree with the position that there must be five times the distance kept from one water intake than another, as in the case of the Sunflower intake and the Topeka intake. Also, we cannot find any facts to substantiate the positions taken on the allowable distances a dredge must keep from the mean high water mark given the radius of the river's bend.

15

The City of Topeka recently constructed a new weir immediately downstream of its water intake structures. The weir functions like a dam and raises water surface elevations at the intakes. In addition the weir is designed to accommodate a minor amount of riverbed degradation without adversely impacting the City's ability to withdraw water. In contrast water surface elevations at the Sunflower Army Ammunition Plant's water intake structure, during low flow conditions in the river, are critically low and may not meet the plant's mobilization requirements in the event of an emergency. Since any additional riverbed degradation in the reaches of river near the Sunflower Plant's intake could worsen existing problems, the undredged zone near the intake must be considerably greater than that for the City of Topeka's water intake structure. The outside of river bends with a radius of curvature of 4,000 feet or less are generally highly erodible. The 200 foot distance that a dredge must maintain from the ordinary high water mark, in such bends, will reduce dredging related impacts in these relatively unstable areas of the river channel.

The resulting Regulatory Plan which is proposed contains the same inconsistencies that the Regulatory Report has. It is important that we point out a few additional concerns about the rules of operation which we believe are unnecessary. Given that each permit for a given area must be applied for, the Corps should consider then what specific limiations should be applied to the area being permitted, rather than trying to define those limitations in the Plan. Also, as the permit is renewed, the Corps should review conditions to then make any changes. This could cover the area of bed degradation by including limits as part of each permit.

16

The Regulatory Plan contains restrictions that apply to most dredging operations on the River. However, since physical conditions and other factors vary, from reach to reach, additional restrictions may be imposed on individual dredging operations based on a case-by-case evaluation of those operations. The Kansas City District is satisfied that the Regulatory Plan addresses the public interest involved; and therefore, no further consideration will be given to abandoning implementation of the Plan.

Taking into account the fact that there appears to be some allowances for change, may we suggest the following. Instead of 500,000 tons within a ten-mile reach, would a 750,000 ton/fifteen mile restriction be the same? This would be a significant help in Topeka and DeSoto. Also, a three foot annual degradation instead of two, with some allowances for natural occurrences. If possible, the allocation of tonnage allowed per operation should be on a basis of need, relative to sales and years of operation, so as to permit current operators to better satisfy current customers.

17

The annual extraction limit of 500,000 tons of sand and gravel per 10-mile-long reach of river, presented in the draft Regulatory Plan, has been changed to 750,000 tons per 15-mile-long reach in the final Plan. The restriction limiting riverbed degradation to an average of 2 feet for any 5-mile-long reach of river will not be changed. The 2 foot restriction is considered to be the maximum amount of degradation that can be allowed if secondary impacts, which result from dredging-induced degradation, are to be kept at an acceptable level. In the event that more producers apply to dredge in a given reach of river than can be accommodated, at the maximum allowable individual rate of sand and gravel extraction (300,000 tons per dredge), many factors would be considered by the Kansas City District before a decision is made regarding distribution of the limited resource. Although the allocation of material could be based on need relative to past/present sales and years of operation, other factors may also be appropriate when considered on a case-by-case basis.

As stated in the Plan, many of the determinations on restrictions are a "professional judgement" of your staff. We would ask that this judgement doubt its own infallibility, and allow for some flexibility in both the final draft of the Regulatory Plan and the individual permit requests. This allows for continued improvement in the Plan without placing unnecessary burdens on both the markets and the producers. A smooth transition into restricted dredging conditions will prove better for all interested parties and give all sides to this issue a period for further development of alternative sources of material.

18

Comment is noted.

CORPS RESPONSE TO COMMENTS

Our final area of concern deals with the monitoring system proposed by the Plan. In it the producers are to be responsible for carrying out a monitoring program which will be beneficial to the regulatory efforts. To this we find many faults. First, although we hope to see dredging remain on the Kansas River for many years, future market changes as well as depletion of saleable products in the river could shut down dredging. This would result in the cessation of the monitoring program. Since we maintain that the cause of changes on the river are the results of many elements, and there are many interested parties who wish to receive regular reports on the river, it would seem appropriate that the cost of this monitoring should be shared by all parties. This would assure the continuation of the program as well as allow for more detailed information to be gathered. 19

In conclusion, we believe more careful examination of the facts are in order before a final draft of the EIS and the Regulatory Plan are completed. A good comprehensive monitoring program, coupled with a slow transition to a regulated environment, is the best assurance that no unnecessary burden is placed on the public. It is important that the Corps makes every effort to assure that the maximum number of tons of aggregate can be produced and supplied to the market. If not, a "tax" will be wrongfully placed on the pubic which your staff serves. The final regulatory plan should make certain that no unfair practices by a producer will go unnoticed. Our hope is to ensure the correct implementation of a fair, informed and accurate plan established to take full advantage of this valuable resource, which its users have come to appreciate and respect for decades. We look forward to assisting your staff in the near future to assure a timely completion of a Plan. 20

Sincerely,

Peter E. Powell
President

PEP:nd

cc: Woody Moses
Kevin Dempsey
Dave Johnston

CORPS RESPONSE TO COMMENTS

Monitoring data is only being required from those reaches of the river that may be impacted by commercial dredging operations. The Monitoring Program is necessary to ensure that the established maximum acceptable level of impacts will not be exceeded; and therefore, its funding will be the responsibility of the producers.

Comment is noted.

Builders Sand Co.
4919 Lamar Avenue • Mission, Kansas 66202
(913) 262-7263

April 7, 1989

Colonel John H. Atkinson, District Engineer
Kansas City District Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Colonel Atkinson:

The following remarks are in response to the Draft of the Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River dated January, 1989.

In the public meeting on February 15, 1989, several of the questions posed by the sand producers regarding the Regulatory Plan were classified as "administrative issues" that would be dealt with after the Regulatory Plan was in effect.

During subsequent meetings with the Corps of Engineers, it became our opinion that there were several administrative issues and questions that needed to be addressed prior to the issuance of a Regulatory Plan. Listed below is a brief description of several of these issues that we believe should be addressed prior to the issuance of the Regulatory Plan.

According to the studies, the amount of sand and gravel transported into the reach of the river from river mile 0 to 21.2 is 1.67 million tons annually. The proposed annual extraction rate is 1 million tons for this same reach of river. No doubt the 1.67 million tons per year estimate has some safety factors built into it already. Therefore, it is our opinion that to propose to reduce the quantity of annual extraction allowed from this reach of the river by some 40% more is too restrictive. 1

The subject of contract dredging as a source of barrow material was not addressed in the Regulatory Plan. We feel that in light of the severity of the restrictions that are proposed for the sand producers that at least some limiting statements should be made in the plan with reference to dredging as a source of barrow material. 2

Reference is made to the fourth item in a letter to you from the sand producers dated January 30, 1989. It is our opinion that by changing the limits of 300,000 tons per site and 500,000 tons per 10 mile reach to 500,000 tons per site and 750,000 tons per 15 mile reach of the river, the results would be a more equitable market plan considering the present position on the river of the existing sand producers. If such changes were made in the reach of the river from river mile 0 to 21.2, we might be inclined to forego dredging on one or more of our 3

CORPS RESPONSE TO COMMENTS

25. Builders Sand Company
April 7, 1989

Approximately 1.67 million tons of sand is transported annually into the reach of river downstream of mile 21.2. Some of that material is transported through the reach and into the Missouri River; therefore, the quantity of material trapped in the reach is less than 1.67 million tons. The 1 million ton extraction limit, established for the reach, is considered by the Kansas City District to be the maximum amount of material that can be extracted from the reach annually, if dredging-related impacts are to be kept at an acceptable level.

The Kansas City District does not believe that it would be appropriate nor would it be in the public interest for the District to limit or promote the use of Kansas River sand for a particular construction purpose.

Refer to response 4. to Holliday Sand and Gravel Company's January 30, 1989, letter.

permits in order to concentrate on a permit where the annual allowable extraction would be higher than as presently proposed. In regard to dredging above river mile 21.2, if the annual limit per permit in this reach of the river were set at 300,000 tons each, it is our opinion that this would provide for a better market plan.

These are some of the main points that we consider as important with regard to the formulation of the final Regulatory Plan. There has been some discussion as to how the final plan will have some flexibility incorporated in it. It is our hope that this becomes a fact, both for our future and the future of the general market.

Yours very truly,

John F. Carson
President

JFC:nd

CORPS RESPONSE TO COMMENTS

4 Comment is noted.

KANSAS Sand and Concrete, Inc.
P.O. BOX 656 CURTIS & N. TYLER STS
TOPEKA, KANSAS (913) 235-6284

March 8, 1989

Colonel John H. Atkinson
District Engineer
Kansas City District
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Mo. 64106

Re: Written Objections and Suggestions to
Final Plan for Regulation of Commercial
Dredging on the Kansas River

Dear Colonel Atkinson:

The following letter, including suggestions and comments made by and on behalf of Kansas Sand & Concrete, Inc., 531 N. Tyler, Topeka, Kansas, concern the proposal for the permittees in the reach of the Kansas River in the Topeka vacinity. Kansas Sand & Concrete, Inc. now pumps under permits at mile 83.0 - 85.2 and 85.2 - 85.8.

By way of background, Kansas Sand & Concrete, Inc., as well as its predecessor, Kansas Sand Co., has been in business in the Topeka area since 1922 and has extracted sand from the Kansas River since that time. Present ownership has existed since 1964. In 1988 Kansas Sand & Concrete, Inc. purchased the sand extraction operation of Consumer Sand Co. and a transfer of their permit was permitted for the operation at mile 85.2 - 85.8. In total Kansas Sand & Concrete, Inc. has approximately one million dollars invested in these two operations as well as a million dollars in its ready mixed plant operation at the location in connection with Kansas Sand & Concrete, Inc. on land it owns as part of the permit for mile 83.0 - 85.2. In the purchase of Consumer Sand Co. for the permit at mile 85.2 - 85.8 included were land and certain items of personal property for pumping. We have participated in the activities concerning the study of the Kansas River and all other meetings leading up to the draft proposal dated January, 1989 entitled, "Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas river".

It is important to note that the location of the ready mixed plant and

CORPS RESPONSE TO COMMENTS

26. Kansas Sand and Concrete, Inc.
March 8, 1989

these two sand extraction permits are advantageous, both to the producer and to the public in regard to transportation of sand, including attendant costs, street deterioration and use of pit sites.

Currently in the draft plan, the map of permits, entitled EIS-18, "Commercial Dredging Kansas River", indicates there are four (4) permits on the North side and two (2) on the South side. It should be pointed out, and your investigation, including your own records, should indicate that of the four permits on the north side of the river, all are active except Meier's Ready Mix at mile 75.7 - 76.0 and that of the two permits on the south side only Meier's at 90.1 is active. It is our clear recollection that early in the study and meetings with the Corps, it was stated by Col. Curl, the then district engineer, that no additional permits, future or permenant, would be granted in the Topeka reach of the river. For whatever reason, the Corp. sought to give temporary permits to Meier's at two locations and it is on this very basis that the allocation problem has arisen on our reach of the river. While agreeing that no vested interest exists in these permits, we would expect the Corps to view the over all picture, including the time the permits have been in existence and use, economic investment, environmental object and over all good to the consumer.

At the out set it is agreed that the Corps' proposal, including a restruction of 500,000 tons within any 10 mile reach of the river as well as a limit of 300,000 tons per permit both apply in any situation. Our comments and suggestions are set out below and numbered for your reference and ours in the future.

1. No future permits should be issued within the 10 mile reach of the river in the Topeka area unless it is apparent that those currently in existence are not active and using the proposed tonage quotas to an extent approximating the total allowable for this reach of the river.

2. The Meier's Ready Mix permit at 75.7 - 76.0 and Consumer Sand Co.'s permit at 86.7 - 86.9 should not be renewed.

3. Based on past extraction from the two permits that Kansas Sand and Concrete, Inc. now possesses, we ask that the quota for these in conjunction be no less than 225,000 tons based on past extraction and future needs.

4. The reason for the request in #3 is the fact that due to low river flow in recent past, Kansas Sand Concrete, Inc. needed additional capacity and the most economical way to obtain that was to purchase the Consumer Sand Co. operation, including its permit at 85.2 - 85.8, and further that the Consumer Sand permit at 86.7 - 86.9 mentioned in two above was not a part of consideration in that purchase.

5. The permit of Meier's Ready Mix at mile 90.1 should be given a

CORPS RESPONSE TO COMMENTS

1 Comment is noted.

2 The annual extraction limit of 500,000 tons of sand and gravel per 10-mile-long reach of river, presented in Section II. D. of the Regulatory Restrictions in the draft Regulatory Plan, has been changed to 750,000 tons per 15-mile-long reach in the final Plan. Since the total average annual sand and gravel extraction rate for all of the producers currently operating in the Topeka area is approximately 400,000 - 500,000 tons, a potential allocation problem has been eliminated. The 750,000 ton limit significantly exceeds historical and current cumulative annual extraction rates and is expected to meet the areas needs through the foreseeable future.

3 Refer to response 2. above.

4 Refer to response 2. above.

5 The division of limited resources among more than one applicant will depend upon a number of circumstances, such as the reach of river to be dredged and the number of applicants applying to dredge in that reach. For instance, if the 6 currently existing permits in the Topeka area are renewed, after implementation of the Regulatory Plan, and if the allocation of material is equally divided among them, each permitted operation would receive an annual allotment of 125,000 tons of material. Other scenarios are also possible.

6 Comment is noted.

7 Refer to responses 2. and 5. above.

quota consistent to the existing permits that have pumped consistently for many years prior to the existence of the permit at mile 90.1.

6. Absolutely no consideration whatsoever should be given to the fact that Meier's Ready Mix had obtained a permit at mile 75.7 - 76.0 and mile 90.1 since little or no extraction ever took place at 76.0 and consequently there are no equities existing on the part of Meier's Ready Mix to allow a disportionate quota.

7. Any monitoring of production must contain safe guards for honest reporting of producers and appropriate penalties for violations, including taking away the permit itself.

8. The production records should be subject to the inspection of all the permittees if possible and Kansas Sand & Concrete, Inc. would waive any rights of privacy it might have to insure this knowledge.

9. The cost of monitoring the production should be based fairly on the amount of production each permittee has on some equitable system agreed to by the permittees.

10. The implementation plan should state clearly which agency of government will be in charge of the report, the monitoring and enforcement with the goal in mind of keeping such costs, if they are to be passed on to the producer, at reasonable levels.

11. The proposed production limitation of 500,000 tons in the 10 mile reach should include some latitude for changing conditions which in its present form does not appear to do.

12. The suggestions of producers stated at an informal meeting held on March 6, 1989 in Kansas City should be considered as concerns concrete sand vs. fill sand and the economic impact to the producer.

13. The matter of contract permits should be addressed by the plan and it is suggested that such permits not be granted within the 10 mile reach in the Topeka area so as to prevent the possibility of bank degradation.

In conclusion, we would like to point out that during the course of the Corps' study the producers in the Topeka area were virtually assured that the Corps' proposal would not result in any quotas for the Topeka reach of the river and while no promises to this effect were made in writing, this most certainly was the assumption under which we labored. Since this assumption is not to be realized, we sincerely urge that the Corps deal with each producer on a fair basis, both individually and collectively, bearing in mind all the suggestions as received, both from the undersigned producer and any others who comment. Had the Corps allowed no additional permits or granted

CORPS RESPONSE TO COMMENTS

7

8 Refer to responses 2. and 5. above.

9 Comment is noted.

10 Comment is noted.

11 The Kansas City District believes that the division of monitoring costs should be resolved among the producers.

12 The Kansas City District is the agency responsible for issuing and enforcing the subject permitted activities, and as such, it is the agency responsible for assuring that monitoring requirements are met. Monitoring requirements have been established and are presented in the Monitoring Program in the Regulatory Plan. The cost of such monitoring is the responsibility of the producers.

13 Refer to response 2. above.

14 Comment is noted.

15 Permit applications will be considered on a case-by-case basis. Refer to response 5. above.

16 Comment is noted. Also, refer to response 2. above.

permanent ones only beyond the ten mile limitation of the Topeka ten mile reach, there would be no quota roblems whatsoever in this reach. From the standpoint of this particular producer, who has expended considerable additional money to take over the Consumer Sand Co. operation and who as a taxpayer pays considerable local, state and federal taxes and maintains a very clean operation from an environmental standpoint, we ask fair consideration for our suggestions. It is suggested that if the Corps is not well acquainted with the facts and permittees in the Topeka area, that people from your office make a personal investigation by visiting the area and inspecting the plants in operation to be well acquainted before making their final implementation plan.

We respectfully submit this letter with its suggestions and requests signifying our willingess to cooperate and participate in the implementation of the Corps' final plan.

Yours very truly,

KANSAS SAND & CONCRETE, INC.

Ralph L. Larson

Ralph L. Larson
Asst. Secretary and
Corporate Counsel

RLL/ds

CORPS RESPONSE TO COMMENTS

PENNY'S

PENNY'S CONCRETE CO.

March 21, 1989

Department of the Army
Attn: OD-P
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Sir,

As a major consumer of Kansas River Sand, we will be greatly affected by any limitations put on the dredgers. This move must be done gradually and with the idea of keeping supplies ample to meet current demands.

Sincerely,

PENNY'S CONCRETE, INC.

William J. Penny
President

/sb

P.O. BOX 705 · LAWRENCE, KANSAS 66044 · 913/843-8100 · K.C. AREA 913/441-4197

CORPS RESPONSE TO COMMENTS

27. Penney's Concrete Co.
March 21, 1989

1 Comment is noted.

Meier's Ready Mix

Office
(913) 233-9900

P.O. Box 8477 • 1401 N.W. Hi-way 24 • Topeka, Kansas 66608

Plant
(913) 233-2423

Plants in Holton - Junction City - Osage - Ozawkie - Topeka

March 22, 1989

Mr. Robert Smith Regulatory Branch
Department of the Army
Kansas City District, Corps of Engineers
Kansas City, Missouri 64106-2896

Dear Mr. Smith:

Reference to Colonel Atkinson's letter of March 15, 1989 advising extention of time has been granted for comment on the Regulatory Report and EIS for Commercial Dredging Activities on the Kansas River. Please place our name on the mailing list for a copy of the final report.

Also, we would appreciate a response to our letter, copy attached, dated February 16, 1989 at your earliest convience. 1

Sincerely,

MEIERS READY MIX, INC.

Vince Meier

Vince Meier, Vice President

VM:hgd

B-70

CORPS RESPONSE TO COMMENTS

28. Meier's Ready Mix
March 22, 1989

1. The referenced document refers to a matter unrelated to comments concerning the draft Regulatory Report and Environmental Impact Statement.

KAW VALLEY Sand & Gravel, Inc.
P.O. Box 11055, 5900 Thorn Drive
Kansas City, Kansas 66111
Phone 913-287-7059

April 17, 1989

ATTN: OD-P,
Environmental Resources Branch,
Planning Division,
Department of the Army,
Kansas City District, Corps of Engineers,
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Colonel Atkinson:

In responding to the draft "Regulatory Report and Environmental Impact Statement For Commercial Dredging Activities On the Kansas River", I think it would be appropriate to give a brief overview of Kaw Valley Sand and Gravel, Inc.

Kaw Valley Sand and Gravel, Inc. started in business on June 29, 1984. It's two principals, Benjamin G. Kates and myself, previously worked for Hub Materials, Inc., which in our opinions would file for bankruptcy in the winter of 1984 - 1985. (Because of our business dealings, Hub Materials, Inc. was able to delay the filing, but did so ultimately in February 1988). Hub Materials, Inc. had been Stewart Sand and Materials, Inc. fifteen years previously, and was unequivocably the predominant sand producer in the Kansas City Area.

Kaw Valley Sand and Gravel, Inc. currently operates its dredging operations, hereinafter referred to as the Morris Plant, between river miles 12.3 and 12.9. We also have a permit between river mile 8.0 and 9.3, and operate a dry sand plant located at 5900 Thorn Drive, Kansas City, Kansas. Kaw river sand is of particular concern to our company as we rely heavily on the local fiberglass industry to purchase their raw sand requirements from us. (Missouri river sand does not have an acceptable chemical composition for use in the manufacture of fiberglass). Kaw Valley Sand and Gravel, Inc. has produced and sold over 400,000 tons of sand in each year it has been in business. This represents a dramatic and undesirable decrease from the annual productions of our predecessors, Hub Materials, Inc. and Stewart Sand and Materials, Inc.

Kaw Valley Sand and Gravel, Inc. acknowledges that restrictions are going to be imposed on dredging sand from the Kansas River. However, we are particularly concerned that the restrictions may be so stringent that it will be impossible for us to remain in business, ultimately destroying the jobs of our 30 plus employees. There has been a dredging operation located at our Morris Plant, between river miles 12.3 and 12.9, for over 30 years. The initial operation was installed in 1957! The draft report states on page 29 that sand and gravel extraction will be limited to 300,000 tons between river miles 12.4 and the Water District No. 1 of Johnson County Weir at river mile 15.0. Currently two dredging operations exist in that reach, including ours, and one other is permitted. Kaw Valley Sand and Gravel, Inc. is the only sand company, permitted in that reach, that does not have a plant

CORPS RESPONSE TO COMMENTS

29. Kaw Valley Sand and Gravel, Inc.
April 17, 1989

operating elsewhere.

On page 30 of the draft report you indicate that any one dredge will be limited to 300,000 tons of sand and gravel extraction per year. The Corps of Engineers itself acknowledges that an operation producing 300,000 tons annually, in the Kansas City area, "is probably getting close to the breaking point at which that operation becomes relatively inefficient". Kaw Valley Sand and Gravel, Inc. requires at least 450,000 tons production annually to be a break even proposition. As indicated earlier, this production is far lower than annual production at that same location in the 25 years prior to Kaw Valley Sand and Gravel, Inc.'s inception.

Further restrictions contained in the draft report, if enacted, could impact sand dredging at our location. Specifically, they are included in the following sections:

1.) Restrictions Concerning the Distance Between Adjacent Permitted Dredging Boundaries. Page 30.

2.) Water District No. 1 Weir. Page 31.

3.) Restrictions Concerning Natural Formations. Page 32.

4.) Natural Rock Deposit between River Miles 12.2 and 12.4. Page 32.

Certain combinations of the restrictions could be severely detrimental to the dredging operations of our company. Kaw Valley Sand and Gravel, Inc. already operates within the shortest permit down river of the Bowersock Dam. We would request that you do not further limit us. It is unlikely that a dredging operation can exist in the Kansas City Metropolitan area in a reach of river less than 0.6 miles.

Kaw Valley Sand and Gravel, Inc. has considerable reservations concerning the monitoring program. It is unreasonable to establish the baseline for degradation before full implementation of the regulatory plan. If this were done, unrestricted dredging, or restricted dredging in excess of the final, fully implemented restrictions, will reduce the baseline at a rate both exceeding and inconsistent with the intentions of the regulations. To be unilaterally fair it would seem reasonable to implement the regulatory plan as soon as feasible, especially when one takes into account that the majority of producers already fall close to or within the limitations. At the very least, the determination of the baseline should wait until full implementation of the regulatory plan. In addition, it is important for the market to get into line with the supply as soon as possible. This will only occur if the regulatory plan is implemented immediately and all producers fall into compliance with the regulations.

From preliminary information the monitoring program is going to be extremely costly to the producers. For this reason we ask that no monitoring be required between the Turner Bridge and the Missouri River. Although we currently hold a permit in that reach of the river, no dredging is presently done. In addition we ask that monitoring be initiated at the time of full implementation of the regulatory plan and be performed every 4 years rather than the suggested 2 years. This should provide the Corps of Engineers with accurate and sufficient data while saving the sand producers significant amounts of money.

CORPS RESPONSE TO COMMENTS

1 The 300,000 ton annual limit per individual dredging operation is considered to be the maximum allowable amount of material that can be extracted annually, if localized impacts are to be kept at an acceptable level. Therefore, no increase in this limit is considered appropriate.

2 Comment is noted.

3 Comment is noted.

4 Refer to response 3. to Kaw Sand Company's April 4, 1989 (21), letter.

5 Refer to response 3. to Holliday Sand And Gravel Company's January 30, 1989, letter and to response 3. to Kaw Sand Company's April 4, 1989 (21), letter.

I would like to take this occasion to thank you for the opportunity to comment on the regulatory plan and the monitoring program. I trust that you will consider my comments with great concern and enable us to remain a part of the sand industry in the Kansas City Metropolitan area. Should you have any questions please do not hesitate to contact me.

Yours sincerely,

KAW VALLEY SAND AND GRAVEL, INC.

Adrian Y. Drummond

ADRIAN Y. DRUMMOND
EXECUTIVE VICE-PRESIDENT

AYD:slb

CORPS RESPONSE TO COMMENTS

KANSAS READY MIXED CONCRETE ASSOCIATION
KANSAS AGGREGATE PRODUCERS' ASSOCIATION

316-687-1122 • 250 N. Rock Rd., Suite 340 • Wichita, KS 67206-2243

—OFFICERS—
EMIL MUELLER
President
KEN BROWN
1st Vice President
DICK FANKHAUSER
2nd Vice President
LEE RAINEY
Secretary-Treasurer

—OFFICERS—
TOM McADAM
President
DAVID ABELL
Vice President
GEORGE MAY
Secretary-Treasurer
EDWARD R. MOSES
Managing Director

March 10, 1989

Colonel John H. Atkinson, USA
Department of the Army
Kansas City District - Corps of Engineers
700 Federal Building
Kansas City, Missouri, 64106-2896

RE: Regulatory Report and Environmental Impact Statement (EIS) For Commercial Dredging Activities On The Kansas River

Dear Col. Atkinson:

The purpose of this letter is to request a 30 day extension of the review and comment period on the above captioned draft report and EIS. The Kansas River sand dredgers need additional time to prepare detailed written comment on the draft regulatory report. 1

During the February 15, 1989 public hearing the Corp requested we withhold comment and specific detailed questions. At that time the producers were informed that their concerns would be heard at a future meeting, where more time could be devoted for detailed questions and answers. This meeting was held on March 6, 1989. Many questions remained unanswered at that time as the primary drafter of the plan was unable to attend the meeting. This meeting is now rescheduled for March 16, 1989. Obviously, we will not be able to fully develop and submit detailed written comment by March 17, 1989.

The Kansas River sand producers suffer severe adverse impact as a result of the proposed regulatory plan; the additional time is needed to adequately prepare our comments. We would appreciate your favorable consideration of this request.

Sincerely,

Edward R. Moses
Managing Director

cc: Kansas River Sand Producers
Congressman Jim Slattery

K.R.M.C.A. DIRECTORS K.A.P.A.
RICHARD ALLEN, GARY CULLOR, JIM COFFIN, NORBERT DREILING, STEVE GLASS, GARY GRUENDEL, PETER POWELL, HAROLD MORGISON, GEORGE PEARSON JR, KEN PLATT, GORDON McCAULEY, ROBT. HARRIS, M&T, ROBT. BIVENS, M&T

CORPS RESPONSE TO COMMENTS

30. Kansas Ready Mixed Concrete Association and Kansas Aggregate Producers' Association
March 10, 1989

Concur. The comment period was extended until April 17, 1989.

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
1957 E Street, N.W. • Washington, D.C. 20006 • (202) 393-2040 • TELEX 279 354 AGC WSH
JAMES W. SUPICA, *President* PAUL EMERICK, *Senior Vice President* KIRK FORDICE, *Vice President*
RICHARD E. FORRESTEL, *Treasurer* HUBERT BEATTY, *Executive Vice President*

March 9, 1989

Colonel John H. Atkinson
District Engineer
Kansas City District
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, MO 64106

Re: Draft Regulatory Plan -
Kansas River

Dear Colonel Atkinson:

The Associated General Contractors of America requests that the comment period for the above referenced draft regulatory plan be extended by 30 days in order to accommodate additional comments from concerned parties.

AGC believes that his request is reasonable given the importance of this matter to construction industry in this multi-state region.

Sincerely,

David A. Johnston

DAVID A. JOHNSTON
Director
Heavy-Industrial Division

cc: Bory Steinberg, CE CW-R

CORPS RESPONSE TO COMMENTS

31. The Associated General Contractors of America
March 9, 1989

1 Concur. The comment period was extended until April 17, 1989.

R.H. PLUNKETT CO. INC.

P.O. BOX 551
OLATHE, KANSAS 66061

(913) 764-0133

ROBERT PLUNKETT
President

March 15, 1989

Colonel John H. Atkinson, District Engineer
Kansas City District
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Mr. Atkinson:

As a part of the construction industry of Greater Kansas City, I feel I must express my grave concern regarding the proposed Regulatory Plan issued by the Corps of Engineers which would restrict dredging of the Kansas River.

The Kansas River is a primary source of quality construction materials, and for the Corps to so severely cut back that source would cause hardship to the construction industry and to the economic well being of the Kansas City metropolitan area. 1

While we appreciate the fact that the Corps is concerned with maintaining ecological balance in the Kansas River basis as well as preventing damage to bridge abutments and other structures that uncontrolled dredging might cause, we feel that the Regulatory Plan in its present state would create far deeper problems than it will resolve. 2

We would appreciate any help you might offer.

Sincerely,

Robert H. Plunkett

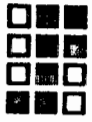
Robert H. Plunkett
President

CORPS RESPONSE TO COMMENTS

32. R.H. Plunkett Co., Inc.
March 15, 1989

The Kansas City District's selected alternative (restricted dredging) is a compromise between the extremes of the alternatives available to the District. The elimination of all dredging on the river was not considered an acceptable alternative nor was unrestricted dredging considered acceptable. The limitations established in the final Regulatory Plan are considered by the Kansas City District to be the minimum requirements necessary to keep dredging-related impacts at an acceptable level. Implementation of the Regulatory Plan may temporarily disrupt sand and gravel supplies in the Kansas City metropolitan area; however, any disruption to the area is expected to be minor, since alternate sources of material are available in the Kansas River floodplain and especially in the Missouri River. In addition, the Plan will be phased-in over a 3-year period for existing dredging operations located in previously dredged reaches of the river, except for the newly opened reach of river upstream of Bonner Springs.' Refer to response 1. to Holliday Sand And Gravel Company's January 30, 1989 , letter and to response 1. to Holliday Sand And Gravel Company's April 14, 1989, letter.

Refer to response 1. above.



Jim
Plunkett
Inc.

March 23, 1989

Colonel John H. Atkinson, District Engineer
Kansas City District
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Colonel Atkinson,

Please be advised that our office have been made aware of concerns by the sand industry of Greater Kansas City regarding the proposed regulatory plan issued by your office restricting dredging of the Kansas River.

At this time, we wish to comment on the impact that the proposed plan would have on the economic well being of our business, which is dependent on the Kansas River as a resource.

The disruption of the supply of masonry sand to us would cause severe hardship. Every effort should be made to allow for a smooth transition to an alternative source of supply, of which there are few as good as Kansas River sand.

We ask that the proposed regulatory plan be reviewed by your office and that a revised draft copy be made available to the public, which would include such changes as necessary to accomplish the requested transition period.

Thank you for your interest and response.

Sincerely,

Jim Plunkett, President

Lath
Plaster
Stucco

1304 Argentine
Kansas City, KS 66105
913-371-1967

Drywall
Sprayed on
Fireproofing

CORPS RESPONSE TO COMMENTS

33. Jim Plunkett, Inc.
March 23, 1989

1 Refer to response 1. to Holliday Sand And Gravel Company's January 30, 1989, letter.

2 The Kansas City District has determined that the preparation of a second draft Regulatory Plan is not warranted, since only 1 request for a second draft Plan has been received.

34. Roland Hattock
April 3,1989

April 3, 1989

Colonel John H. Atkinson
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Sir:

In regards to the dredging of sand in the Kaw River Basin.

I am a construction supervisor in the masonry industry in the Kansas City area. The impact on the construction industry would be greatly effected by the slowing down of available sand from the Kaw River. Please consider this in your final decision.

Yours truly,

Roland Hattock.

Roland Hattock
Superintendent of Alpha Masonry
120 South 56th Terrace
Kansas City, KS 66111

1 Comment is noted.

THE CHAMBER OF COMMERCE OF
Greater Kansas City

Chairman of the Board

April 17, 1989

Col. Atkinson
District Engineer
Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, MO 64106

Dear Col. Atkinson:

After reviewing the U.S. Army Corps of Engineer's Regulatory Report and Environmental Impact Statement (E.I.S.) for Commercial Dredging Activities on the Kansas River, dated January 1989, and hearing the producer's concerns at the Chamber's Water Resources Committee meeting on March 28, 1989, we wish to enter the following statement concerning the future regulatory requirements for commercial dredging on the Kansas River.

Individual members, past and present, of this Committee, have been monitoring the situation on the Kansas River in excess of ten years. While our main concern in this issue is the productive life of the Kansas River, we do recognize the interests of the dredging industry and those industries in the Kansas City area which they support.

A. It is our considered opinion that regulation is indeed necessary. We ask that you consider a monitored grace period preceeding regulation, during which scheduled visual inspections may be made of the sensitive areas by an inspection team, representing the Corps of Engineers and the producers. We suggest a three year grace period, for existing Kansas River operations, without reduction of production, excepting specific sensitive areas as outlined in the Corps Regulatory Report dated January 1989 (man-made structures). This grace period should provide the producers reasonable time to satisfy existing contractual obligations and make provisions for alternative plants, which we recognize are very expensive. If regular visual inspections reveal significant changes in river conditions, regulations could be implemented or modified at that time.

600 Boatmen's Center • 920 Main St. Kansas City, MO 64105 • (816) 221-2424

CORPS RESPONSE TO COMMENTS

35. The Chamber Of Commerce Of Greater Kansas City
April 17, 1989

1 Refer to response 1. to Holliday Sand And Gravel Company's April 14, 1989, letter and to response 1. to Holliday Sand And Gravel Company's January 30, 1989, letter.

B. There are three large fiberglass companies in this area, representing high employment and producing energy conservation material, which rely on Kansas River sand. Because of the unique nature of this material, we strongly recommend this be taken into consideration on any decisions effecting its production. There are no economically feasibile alternatives to Kansas River sand because of its special chemical characteristics and its close proximity to the manufacturing sites.

C. Monitoring of the river to determine bed lowering - we feel that funding of this type of survey should be shared by all interested parties.

Statements made here convey our ideas on the various areas being addressed. Regulations on dredging have been debated for many years. We feel certain there is room for modification on the proposed regulations which would benefit all interests represented.

Sincerely,

Clark G. Redick

CGR:cb

CORPS RESPONSE TO COMMENTS

2 Approximately 250,000 tons of fiber glass sand is extracted annually from the reach of river located downstream of river mile 22. Since the Dredging Restrictions in the Regulatory Plan provide for the removal of a maximum of 1 million tons of material annually from the reach of river located downstream of mile 21.2, sufficient sand is available to meet the 250,000 ton requirement for fiber glass sand.

3 Refer to response 19. to B.S.C. Holding, Inc.'s March 7, 1989, letter.

WATER DISTRICT NO. 1 OF JOHNSON COUNTY

5930 Beverly — Mission, Kansas 66202
Mailing Address: P.O. Box 2921, Mission, Kansas 66201

Tel. (913) 722-3000

March 13, 1989

Department of The Army
ATTENTION: OD-P
Kansas City District
Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Re: Comments of Draft Regulatory Report

TO WHOM IT MAY CONCERN:

This letter is in response to and contains comments relative to your proposed "Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River."

Water District No. 1 of Johnson County (Kansas) is a public owned water utility servicing a major portion of Johnson County, Kansas. We presently have 85,694 metered connections serving a population of 240,000.

The Water District appreciates the investigative work that the Kansas City District (KCD), Corps of Engineers has done. We feel that KCD has been appropriately cooperative and responsive. The draft Regulatory Report and Environmental Impact Statement is a very good presentation identifying the adverse impacts associated with sand and gravel dredging operations on the Kansas River.

The Water District staff reviewed the draft and has concern about certain facets of the proposed regulations. KCD proposes that the annual rate of sand and gravel extraction between river miles 0 and 21.2 will be restricted to 1 million tons. This is an average of 47,170 tons per mile. KCD further proposes that within this reach of river, river mile 12.4 to our weir at river mile 15, a maximum of 300,000 tons can be extracted. The proposed regulations prohibit any extraction below our weir to river mile 14.5 (plus or minus). Essentially it allows 300,000 tons to be removed on a stretch of river that is 2 miles in length (from mile 12.4 to 14.5). This is 150,000 tons per mile and it is immediately downstream of our weir and adjacent to portions of our well field.

CORPS RESPONSE TO COMMENTS

36. Water District No.1 Of Johnson County
March 13, 1989

1

The reach of river located between river mile 12.4 and the Water District No. 1 weir is considered by the Kansas City District to be relatively stable. Past dredging operations in this reach have removed quantities of sand and gravel in excess of 1 million tons annually. Therefore, a 300,000 ton annual extraction limit for this reach represents a significant reduction to the potential extraction rate. Also, long-term impacts within this reach will be controlled by the restriction limiting degradation to an average of 2 feet for any five-mile long-reach of the river.

Our letter of January 28, 1986, to Mr. Philip L. Rotert, Chief, Planning Division explained in detail our experiences and concerns relative to our well field and Kansas River dredging. If dredging continues below mile 15 (plus or minus) it would seem that river bed degradation at mile 15 to 11, our main area of concern, will continue as river current attempts to level the bottom profile.

Your regulatory plan proposes a monitoring program to "collect data along the river on a routine basis and to utilize this data to evaluate the impacts of permitted dredging activities." Also, this plan proposes that the dredgers will collect this all-important data. It would seem that some dredgers might be tempted to submit less than accurate data in order to protect their interests.

In conclusion, the Water District would suggest that the stretch of river from mile 15 (plus or minus) to 11 be considered for no dredging to allow it to make the most rapid return to a condition conducive to good water supply. It could become a test reach hopefully monitored by an uninterested test contractor to KCD. The Water District would also request that the proposed regulations go into effect over a shorter period of time than five years. We would propose that it also would be effective before January 1, 1990.

Cordially,

Ralph G. Wyss

Ralph G. Wyss, P.E.
Chief Engineer/Director of
Production Services

RGW/pp

CORPS RESPONSE TO COMMENTS

2

Refer to response 1. above.

3

The contractors employed by the producers and the procedures and equipment utilized by those contractors to obtain monitoring data must be approved by the Kansas City District. The data submitted on behalf of the producers must be accompanied by the contractors field notes containing pertinent raw data in a standard engineering format with appropriate dates, times and locations of data collection. The Kansas City District is satisfied that accurate monitoring data will be provided to the District.

4

The Kansas City District is satisfied that the restrictions imposed on the subject reach of river are sufficient to limit future impacts to reasonable levels. Therefore, no further restrictions will be imposed on that reach of river at this time. Refer to response 1. above. The restrictions presented in the Regulatory Plan will be phased in over a 3 year period for the reach of river downstream of river mile 21.2. Refer to response 1. to Holliday Sand And Gravel Company's January 30, 1989, letter. Due to the length of time required to prepare the final Regulatory Report and Environmental Impact Statement it is not possible to implement the Regulatory Plan prior to January 1, 1990. Refer to response 1. to Holliday Sand And Gravel Company's January 30, 1989, letter.

UNION PACIFIC RAILROAD COMPANY
ENGINEERING SERVICES DEPARTMENT
S J McLAUGHLIN ASSISTANT VICE PRESIDENT ENGINEERING SERVICES

C D BARTON
CHIEF ENGINEER-MAINTENANCE
C L JENSEN
CHIEF ENGINEER-PROGRAMS

P M ABARAY
CHIEF ENGINEER SIGNALS
J R BERAN
CHIEF ENGINEER DESIGN

ROOM 1000
1416 DODGE STREET
OMAHA NEBRASKA 68179
(402) 271-5000

March 9, 1989

Drainage & Waterways:
Project: Kansas River

John H. Atkinson
Colonel, U.S. Army
District Engineer
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Colonel Atkinson:

This is in reference to your letter of January 13 and Draft Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River.

The Union Pacific Railroad has three major bridges over the Kansas River in the Kansas City, Kansas, metropolitan area. In addition, our double-track main line parallels the Kansas River from Kansas City, Kansas, to Topeka, Kansas. In fact, in many places our tracks are right next to the river.

We are extremely concerned about the future effects of possible lowering of the river surface and/or riverbed, especially as it relates to possible scouring under the piers of our bridges. We are also concerned about future bank erosion or channel widening in areas where the river is already next to our tracks.

Yours truly,

J. R. BERAN
Chief Engineer - Design

b0309a.plw

CORPS RESPONSE TO COMMENTS

37. Union Pacific Railroad Company
March 9, 1989

1 Comments are noted.

COOK, FLATT AND STROBEL
ENGINEERS, P.A.

6111 S.W. 29th Street
Topeka, Kansas 66614
(913) 272-4706

Branch Offices:

616 Main Street
Joplin, Missouri 64801
(417) 624-4083

1003 Perry Avenue
Suite 101B
Perry, Oklahoma 73077
(405) 336-4349

Douglas W. Flatt, P.E.
President-Treasurer

Kenneth E. Strobel, P.E.
Vice President-Secretary

John E. Virr, P.E.
Vice President

Richard L. Heisler, P.E.
Vice President

Gary N. Shofner, P.E.
Vice President

Norman T. Cook, P.E.
Consultant

April 11, 1989

Environmental Resources Branch
Planning Division
Department of the Army
K. C. District, Corps of Engineers
700 Federal Building
601 E. 12th
Kansas Citv, MO 64106-2896

Attn: OD-P

To Whom It May Concern:

We are responding on behalf of Tri County Drainage District, Rossville, Kansas to the draft of the "Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River".

Tri County Drainage District wishes to express their support of the findings regarding the morphology of the Kansas River. Bourbonais Creek, under the control of Tri County Drainage District, was relocated and improved in the late 1940's. Plans for the channel improvement are on microfilm at the Division of Water Resources in Topeka. Due to many scour and embankment stability problems which have occurred in recent years, Tri County Drainage District has initiated a study and redesign of the channel. New survey data indicates the upper end of the channel at the northeast corner of Sec 25, T10S, R12E is still at or very near its original design elevation. However at its lower end, or mouth, where it discharges into the Kansas River the flowline has degraded approximately 5 feet, therefore verifying the report's findings.

It is our opinion that the change in flowline elevation at the mouth of Bourbonais Creek has created the channel stability problems now facing Tri County Drainage District. It appears that correction of the problem will be quite expensive.

CORPS RESPONSE TO COMMENTS

1 Comments are noted.

We appreciate the opportunity to respond.

Very truly yours,

For Tri County Drainage District

Richard L. Heisler, P.E.

cc: Dennis Hall

RLH/rh

CORPS RESPONSE TO COMMENTS

39. Eulalia M. Lewis
March 30, 1989

Dear John Atkinson

Thank you for your notice. After a lot of phone calls - I was able to find a copy of the Draft "Regulatory Report and Environmental Impact Statement for Commercial Dredging Activities on the Kansas River" at the Board of Ag - Division of Water Resources in Topeka.

I read through it and found it to be a good document. It is tough to decide where to mine the land or river for sand. My worry? about the Activity West of Westgate Bridge may be solved. They may be indicted for violations of oil and gas storage and building a new building not permitted with the current zoning -

1 Comments are noted.

Thank you again

Eulalia Lewis

Orville O. Rice Memorial Nature Trail

Artist: Eulalia M. Lewis

Created for and all proceeds donated to the
Topeka Parks and Recreation Nature Trail System