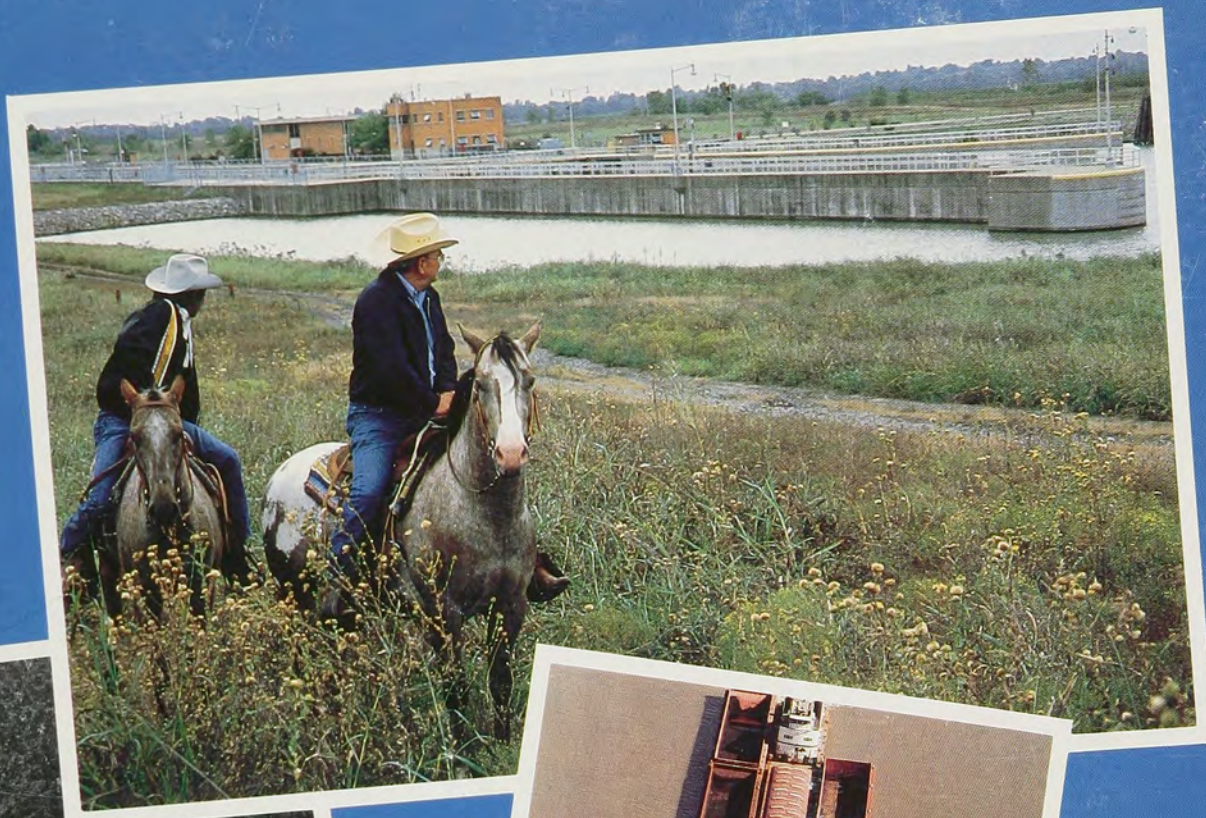




# FIFTY YEARS REMEMBERED

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THE FIRST 50 YEARS  
OF THE TULSA DISTRICT  
U. S. ARMY CORPS OF ENGINEERS

# Report Documentation Page

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To: Mr. Daniel B. Clark

20 Oct 92

Best Wishes from the  
employees of the Tulsa District.

Al Williams  
Col, EN  
Commanding



# FIFTY YEARS REMEMBERED

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## The First 50 Years of the Tulsa District, U.S. Army Corps of Engineers

*A memory scrapbook  
in pictures and anecdote  
dedicated to the Esprit de Corps —  
the indomitable spirit that has guided  
the men and women of the Tulsa District  
throughout 50 years of progress.*

---

**Tulsa District Engineer/** Col. Frank Patete

**Project Manager/** Beverly Leland

**Author/** Ann Patton

**Managing Editor/** Larry Silvey

**Production Manager/** Michael Shelton

**Art Director/** Julius H. Johnson

**Associate Art Director/** Elizabeth A. Mitchell

**Technical Editor/** Tom Warren

**Photo Editor/** Beverly Leland

Published July 1, 1989,  
by the Tulsa District  
U.S. Army Corps of Engineers  
Tulsa, Oklahoma  
through the U.S. Government Printing Office



**1959: Tulsa District's Duck Club members at Great Salt Plains, left to right: Ed Herb, Dean Hodgden, Bob Hunter, Lee Hogue.**



## FOREWORD

---

**J**uly 1, 1989, marks the 50th birthday of the Tulsa District of the U.S. Army Corps of Engineers. Such a golden milestone calls on us to pause a moment and look back thoughtfully, to learn where we have been and what we have done.

Did we leave the land and its people better off? Did we make a positive difference for the people of this region, this nation? Are their lives richer because of the past 50 years' work by the Tulsa District Engineers? Have their burdens been lightened, their futures brightened?

To help us look back and learn, we offer this book of stories and pictures about our first 50 years.

These are stories of people — people thousands-strong who have worked on behalf of the District over the past five decades.

These are stories of preparedness — of a District that has provided more than \$2 billion in military projects, supplies, and services, in peacetime and in war.

And these are stories of projects — public works that have prevented \$2 billion in flood damages, moved 50 million tons of navigation cargo, produced \$3.3 billion in hydropower, reserved 2 million acre-feet of water supply, and provided recreation for 1.2 billion lake visitors.

If the reader gains from these pages some sense of the scope of our mission and shares our renewed commitment to future excellence, our purpose in this publication will be well served.

COLONEL FRANK PATETE

Tulsa District Engineer

U.S. Army Corps of Engineers

Tulsa, Oklahoma

July 1, 1989



**There is no history.  
There is only biography.**

— Emerson



## PREFACE

---

**T**hey said it couldn't be done. And, as it turned out, they were right.

The full and complete 50-year story of the Tulsa District U.S. Army Corps of Engineers really can't be captured between the two covers of one book.

We have hinted herein of those stories in this golden anniversary scrapbook that preserves memories of this civil army of willing workers who took the Tulsa region by storm in 1939.

This book is dedicated to the esprit de corps: the spirit of the Corps, alive and well in the Tulsa District. It speaks of a remarkable devotion and commitment among the corpsmen and women to their mission, to their group, and to one another.

They call it the Corps family, without blushing, and indeed it is.

This scrapbook has been compiled and threaded together almost entirely from the work of others. The photos and stories are a fraction of those we wanted to include; each person shown or described stands for scores of others. It rests foursquare on the work of the late historian, Dr. William A. Settle, Jr., whose scholarly work documented the Tulsa District history. In fact, so much of the information contained herein comes from Dr. Settle's work that we here issue a blanket footnote crediting to him a debt that can never be repaid.

The great tragedy of this endeavor was that Dr. Settle died unexpectedly on the week our work began, leaving us immeasurably poorer and requiring us to proceed, as best we could, without his gentle guidance and wisdom.

Perhaps the greatest surprise of this project was that the Tulsa District staff gave us great editorial freedom. Col. Frank Patete set the ground rules when he authorized a commemorative book that he hoped would be alive with photos and lively with anecdotes.

The great delight was the Corps project manager, Beverly Leland, who was the hub and soul for all the work. When we learned that, in the name of economy, the Corps had destroyed 10,000 photos we had counted on, Beverly cheerily rolled up her sleeves and assumed the additional task of photo editor, collecting and perusing more than 20,000 photos and slides that she finally narrowed to those used here. This book would never have been completed without Bev, and we recommend that she be officially designated an Engineering saint.

Thanks are also due to the dozens of others who helped produce this book. The guiding editorial light was editorial manager Larry Silvey, who was ably assisted by production manager and typographer Mike Shelton, art director Rusty Johnson, associate art director Liz Mitchell, and technical editor Tom Warren. Special thanks go to the Corps' Ross Adkins, Barbara Cravens, Bob Freeman, Bill Gamel, Don Holden, Jerry Nash, and Cindy Richmond. Historians Danney Goble and Neal McNeill lent essential support, as did J.D. Metcalfe and Juanise Ableson. Many others helped; you know who you are and will recognize your contributions herein.

More than once someone at the District has apologized, with a little smile, that the Corps is "dull." But we never found it so. Rather, the stories of the Tulsa District bubbled up endlessly, stubbornly refusing to arrange themselves in smart military fashion into the cold black-and-white of type and page. Even as we try to close the covers, the stories still are bubbling up and, we trust, will continue to do so — like irrepressible springs, the essential esprit of the corps — over the next 50 years or so . . . .

Ann Patton  
Tulsa, Oklahoma  
July 1, 1989



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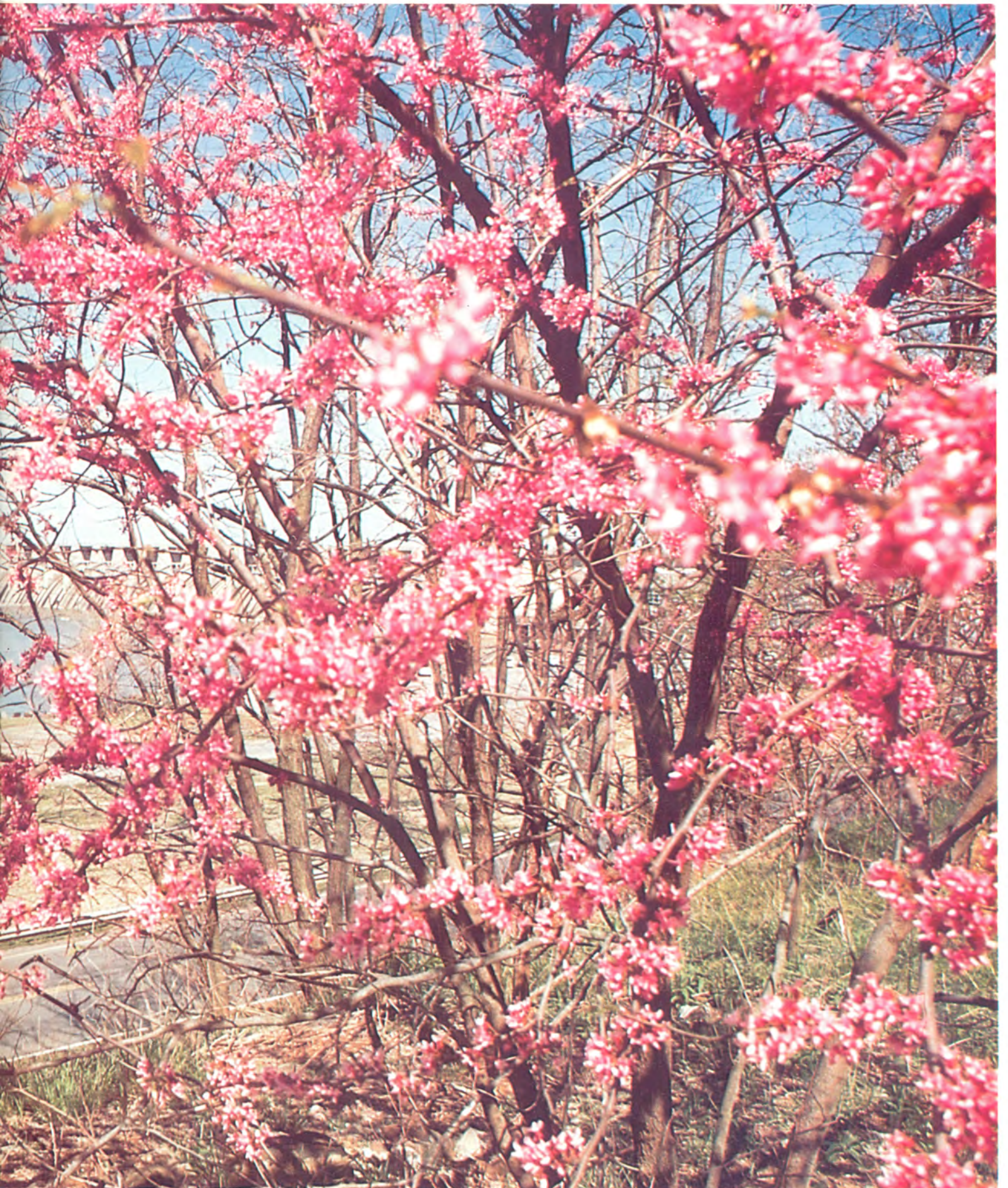
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**Fort Gibson Dam:**

**The desert shall rejoice  
and blossom as the rose.**

**— Isaiah 35:1**





## ***IN MEMORIAM***

---

### ***Dr. William A. Settle, Jr.***

***August 20, 1915, to March 1, 1988***



**T**he Tulsa District, U.S. Army Corps of Engineers, pays tribute to the memory of its historian, Dr. William A. Settle, Jr., retired head of the University of Tulsa History Department, who died as work on this book was commencing.

Dr. Settle was author of *The Dawning, a New Day for the Southwest, A History of the U.S. Army Corps of Engineers, Tulsa District*. Before his illness and death he also worked on updating that 1971 history. Much of this book derives from his distinguished and scholarly research and historical accounts.

***Webbers Falls Dam turbine  
repair:***

**Experience is by industry  
achieved  
And perfected by the  
swift course of time.**

**— Shakespeare**







**1987: An explosion of balloons marked the U.S. Constitution bicentennial in downtown Tulsa. Lake users included (clockwise from upper right) Fort Gibson wheelchair artists,**

**Oologah youngsters and fishermen, Pat Mayse raft riders, Keystone Triathlon swimmers, Broken Bow hikers, and Keystone campers.**



**SECTION 1:**  
**FIFTY YEARS OF PROGRESS**

---





## Chapter 1 INTRODUCTION

---

“How far that little candle throws his beams . . .”

—Shakespeare, *The Merchant of Venice*

---

**W**hat did he know, that brash young planner?

See him in the hazy light of retrospect, an audacious dreamer, perched on his nail-keg chair and hunched over his packing-crate desk.

It's July 1, 1939, day one. The Tulsa District of the U.S. Army Corps of Engineers just opened shop in the Petroleum Building in Tulsa, Oklahoma.

Could he, this planner, envision 50 years into the future? Could he foretell the full scope and effect of his early thoughts, calculations, and jottings? Could he imagine those who would come after him, who would bolster broad-brushed dreams with the wherewithal to see the job done?

He was the first of a new breed with a new way of thinking in a ravaged region. Oklahoma, southern Kansas, northern Texas, and western Arkansas were rising from the ashes of the depression, still choking in the dust bowl.

How could he see the reality he would create?

Could he see

### **SEAGULLS**

**ON THE PLAINS,** nesting near an inland seaport, over there where the dry brush blows down the sleepy streets of Catoosa? Seagulls that would, in time, follow barges from the Gulf and become permanent plains residents on the Verdigris and Arkansas Rivers?

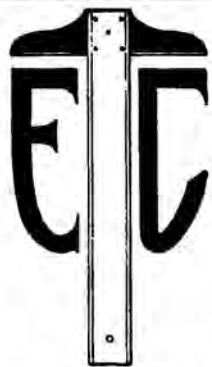


**And the parched ground shall become a pool and the thirsty land springs of water.**

— *Isalah 35:7*



But surely one could view this parched land and know that here was a young planner's delusion. Especially if, after a weekend of farm pond fishing, he was heard to exclaim, "Someday we'll build three dozen lakes — maybe more. There'll be a million acres of lakes two hours from this office — the world's largest concentration of manmade lakes, a water paradise. Shoot, you'll be able to go to the lake on your lunch hour. We'll have more shoreline than Minnesota, more than the entire U.S. Atlantic coast."



# TULSA ENGINEER

THE MONTHLY BULLETIN OF THE ENGINEERS CLUB OF TULSA

Vol. 1

JULY, 1939

No. 7

## U. S. Engineering Department Opens Tulsa Office

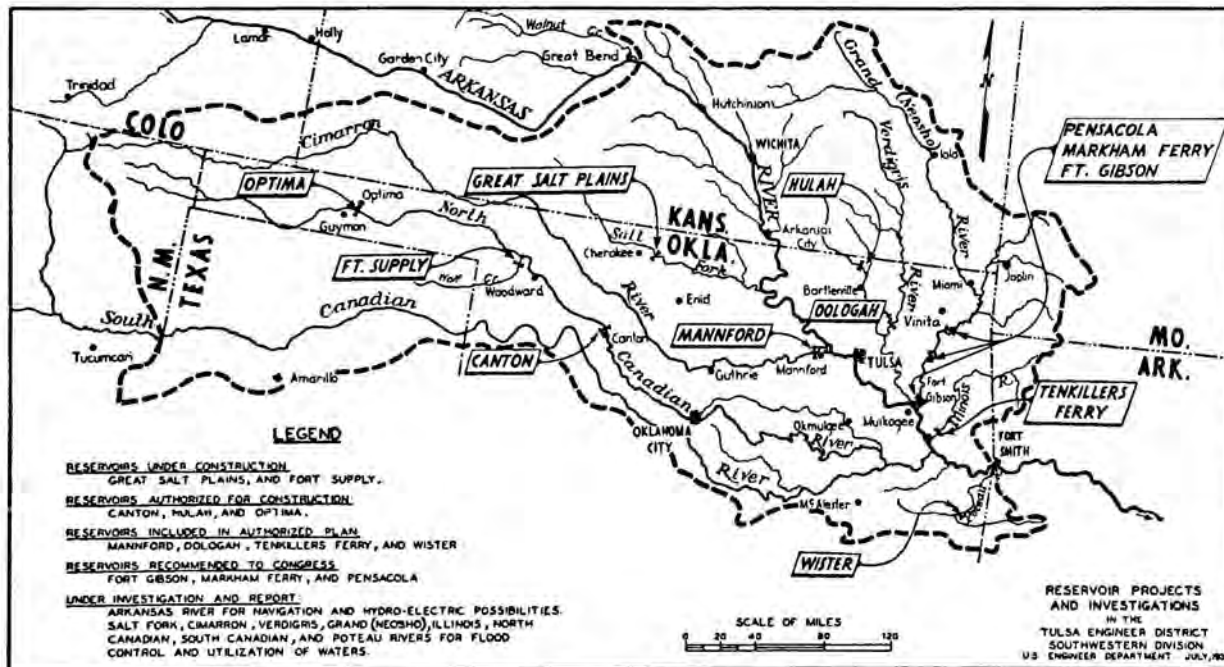
An important event in engineering and civic circles of Tulsa was the official opening of the office of the United States engineering department in the Petroleum Building on July 1st. This office will have charge of the numerous engineering projects authorized by the federal government. Capt. H. A. Mont-

gomery, formerly executive assistant to Col. Eugene Reybold, division engineer, southwestern division of the U. S. Army Engineers, will be in charge of the Tulsa district. The purpose of the work of the U. S. engineering department is to supervise the construction of dams for flood control purposes on streams tributary to the Arkansas River. The waters to be em-

ounded behind these dams will prevent Oklahoma. Three other projects have been authorized with dams to be located at Canton, Blaine County, Optima, Texas County, Hulah, Osage County, Oklahoma. Four additional flood control plans are under consideration, and reports are to be made upon proposed dams at Mannford, Creek County, Oolo-



**1939: The Tulsa Engineers Club welcomed the new Tulsa District Engineers by publishing a map of the bold vision for northern Oklahoma and southern Kansas. Employment potential: 400 workers. Nine lakes were planned or under construction. A few dreamers saw even greater possibilities. . . .**



gomy, formerly executive assistant to Col. Eugene Reybold, division engineer, southwestern division of the U. S. Army Engineers, will be in charge of the Tulsa district.

The Tulsa district embraces an area of 100,075 square miles of which about 65 percent is within the state of Oklahoma, 38 percent in Kansas and smaller portions in Arkansas, Missouri, Colorado, New Mexico and Texas. Within this district the Arkansas River has a length of 494 miles of which 96 miles are classed as navigable. The total length of

flood destruction and will also serve to provide permanent pools for recreational and wild life refuge purposes. Each dam is so located to permit flood waters to be accumulated and later allowed to flow through normal channels to major streams thus preventing low water periods in the Arkansas and other rivers.

There are at present twelve projects under the supervision of this Tulsa district office. Two dams are being constructed, one at Fort Supply, Woodward County, and the other at Great Salt Plains reservoir site in Alfalfa County,

gah, Rogers County, Tenkiller Ferry, Sequoyah County, and Wister, LeFlore County, Oklahoma.

In addition to this work the office here will continue to cooperate in the work on the three dams on the Grand River. The Pensacola dams is now under construction and two other sites are included in this Grand River power project, one to be located at Markham Ferry and the other at Fort Gibson.

All of this work will give employment to more than 400 people, some of whom will live in Tulsa.



**Tenkiller fishing and  
waterway shipping:**

**... the forests where  
silence has lease,  
... the beauty that  
thrills me with wonder,  
... the stillness that fills  
me with peace.**

**— Robert W. Service**



If but he could have foreseen the nature of the water sport industry, he might have pondered that in half a century, thousands of Oklahomans would own recreation boats, and water-skiing would become a growth industry in dry, north Texas.

"Someday," he could have predicted, "we'll take this river that you can walk across today, and we'll turn it into a water highway that runs clear to the Mississippi."

"Suuuuure you will!" his buddies would most likely have jeered. Such dreamers don't share much company, especially at the scratching end of a depression. But the fact is, those early dreams, refined and embellished as time went on, were to come true. The reality was beyond the predictions.

The dark valleys of 1939 would someday twinkle with lights powered by falling water. The ghost of that young planner would walk once-dry prairies now blooming with well-watered crops.

Someday it would rain cats and dogs in eastern Oklahoma and southern Kansas, and the lakes would hold back the water. And the papers would print a story that it didn't flood at all.

## THE FLOOD THAT DIDN'T

*"In the newspaper business, we almost never write big headlines about floods that don't happen. It's the floods that do happen . . . that get the banner-play.*

*"This editorial is an attempt to correct the imbalance.*

*"A \$3 million flood did not sweep down the Grand-Neosho and Verdigris river valleys in Oklahoma and Kansas last June. The heavy rains of June 10-14 and June 20-30 were contained by the Toronto, Fall River, Elk City, John Redmond, Council Grove and Cheney reservoirs in Kansas and the Hulah reservoir in Oklahoma.*

*"According to Col. George A. Rebh, Tulsa district engineer of the U.S. Corps of Engineers, 120,000 acres were not flooded.*

*"The Corps reported that flood control operation of Hulah Dam on the Caney*

*River prevented six feet of flooding immediately below the dam and three feet of additional flooding as far downstream as Ramona, Okla.*

*"Flood control operations for John Redmond and Council Grove reservoirs on the Grand-Neosho River prevented eight feet of flooding at Burlington, Kan., and three feet of additional flooding at Commerce and Miami, Okla.*

*"These are the dams and reservoirs that Oklahomans and Kansans lobbied hard and long for in Congress five, ten, and more years ago. Their efforts may have got some headlines then, but they tend to be forgotten now. Who remembers dry feet?"*

— The Tulsa Tribune, Sept 27, 1967



Photo courtesy Fall River/Toronto Post



**1951: Fall River Dam, emergency flood gates open.**

## **EASTERN OKLAHOMA PROSPERITY**

**E**astern Oklahoma is reaping dividends from river navigation, The Tulsa Tribune reported on Jan. 11, 1973:

*"Dam building, river navigation and the accompanying industrial and recreational development of Eastern Oklahoma seem to be having a healthy effect on personal income in this part of the state.*

*"Fourteen Oklahoma counties had gains of more than 100 percent in median family income from 1959 to 1969, according to the U.S. Census Bureau. And 11 of the 14 counties are in Eastern Oklahoma.*

*"The biggest gain, 127.7 percent, was recorded by McIntosh County, which contains much of Lake Eufaula, the state's largest, and surrounding recreational areas including Fountainhead State Lodge.*

*"Second, at 122.2 percent, was Wagoner County, which has a growing population of Tulsa commuters, recreational areas on Fort Gibson Lake and a potential for industrial development along the Verdigris River waterway . . .*

*"Generally, the counties showing the biggest percentage gains were those with the lowest median incomes in 1959 . . ."*



***A synthesis of sky and sea:  
The McClellan-Kerr  
Arkansas River Navigation  
System opened a dying  
region to a new world of  
waterway work.***

This book is

**A TULSA DISTRICT SCRAPBOOK**, a memory book of some of the experiences and adventures of a special group of people who engaged, over 50 years, in a special mission. These are the people of the Tulsa District of the U.S. Army Corps of Engineers.

They began work 50 years after the Oklahoma land run of 1889 first opened the region to white settlement. A second half-century later, their Tulsa District celebrates, as of July 1, 1989, the golden-age mark.

These Tulsa District employees have believed in their work, with the support of believers and optimists, and in the face of detractors and critics. They have sometimes wavered, occasionally stumbled; but when they are good, they are excellent. And, they have changed forever the lands of this region and the lives of its people.

They have managed a workload that mushroomed from \$11 million in 1939 to more than \$223 million in 1988.

They have produced an estimated \$2 billion in military products and services, mobilized for one world war and several smaller conflicts, and maintained a stable, combat-ready force of military engineers prepared for quick mobilization when needed.

They have produced an estimated \$1.6 billion in civil works projects, focused around water resources development. Every civil works dollar paid for the Corps' efforts over the past 50 years has returned exponentially burgeoning benefits throughout the region. The benefits include water-borne navigation, flood control, hydropower, expanded water supply, irrigation, recreation, fish and wildlife management, and water quality enhancement. Not to mention a resulting boost to the region's economy and private sector jobs.

As they round the half-century mark, these Corps-men and Corps-women manage a half-million surface acres in water resources and another half-million in related land resources.

They regulate and reform, educate and inform.

They are white, black, red, brown, and yellow; male and female, married and single, young and old. They are engineers and secretaries, biologists and park rangers, lawyers and technicians; but above all, they are professionals.

This is their scrapbook. It opens with an overview map and an illustrated timeline that moves quickly over some high points of the Tulsa District history. The story then flashes back to the days when early man discovered the waterways of this region and used them to sustain and enhance life. It traces the region and the Tulsa District through developing the inland waterway that critics said couldn't be done. It follows constructing dozens of major lakes and projects, through wars and rumors of wars, into today's concerns over protecting the environment and curtailing federal spending.

This is their story, and of course there's far more to it than you'll find here.

After all, 50 years has come and gone, and their story has just begun.



*Tulsa workers unfurl the colors, above, and wear the official Corps' crest, below. The Corps' modest motto, "Essayons," means "Let us try."*



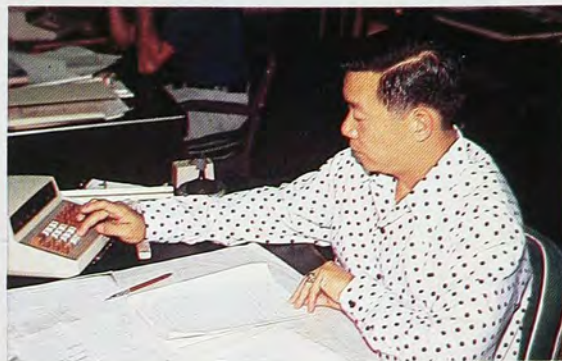




**Presumptuous man! . . .  
This hour a slave, the  
next a diety . . . .  
His knowledge measured  
to his state and place,  
His time a moment and a  
point in space.**

**— Alexander Pope**

... I care not what  
his temples or his creeds.  
One thing holds firm and  
fast.  
Into this heap of days  
and deeds,  
the soul of man is cast.  
— Edwin Markham







## Chapter 2 A SENSE OF PLACE

---

*"We are what suns and winds and water make us."*

— Walter Savage Landor

---

Recognize that

### **THE TULSA**

**DISTRICT DRAMA** plays out on an expanding and contracting stage with a dynamic and diverse cast. It is helpful, then, to sketch the basic parameters that shaped that staging arena.

The District's boundaries have changed over the years — now expanding in line with various national priorities — now contracting, but always centered over the state of Oklahoma.

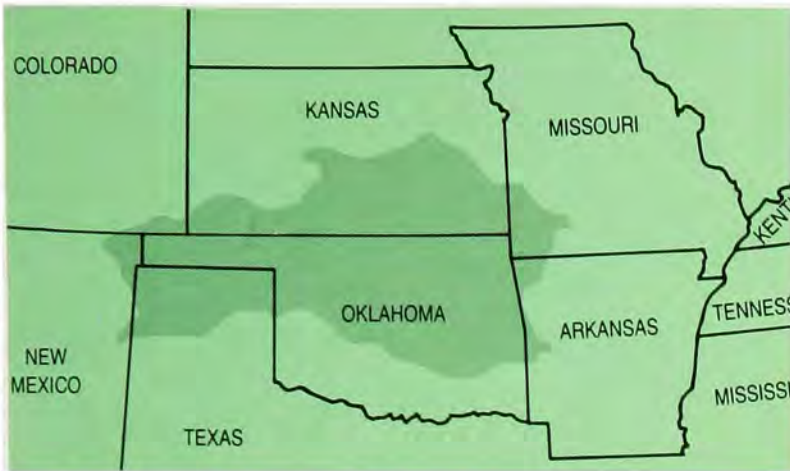
In the main, since its 1945 marriage with the Denison District, the Tulsa District has included the central Arkansas River basin and the upper Red River basin: the state of Oklahoma, the southern half of Kansas, the northern fringe of Texas including the Panhandle, western Arkansas, and small portions of New Mexico, Colorado, Missouri.

But as Tulsa rounded the 50-year mark, its boundaries contracted to encompass only Oklahoma, southern Kansas, and the uppermost northern fringe of Texas, including the Texas Panhandle.

**Is this the region,  
this the soil, the clime  
. . . that we must change  
for Heaven?**

— John Milton

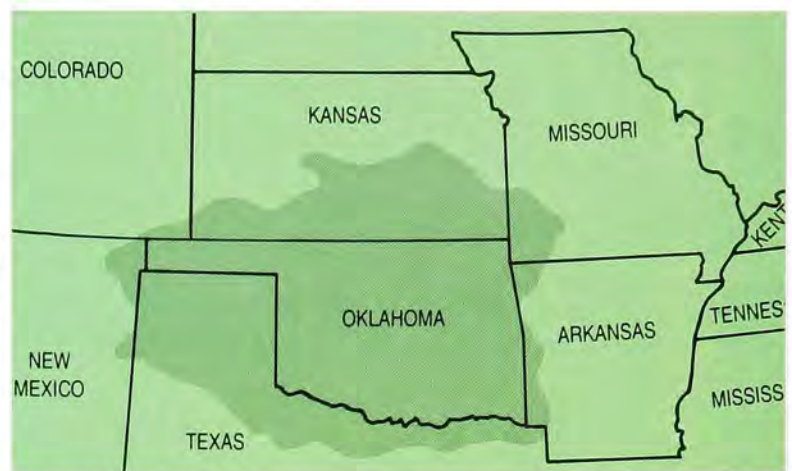




**TULSA DISTRICT 1939-1945**

*Between 1939 and 1945, the Tulsa District's civil works jurisdiction extended throughout the central Arkansas River watershed, covering the lands drained by the river below Great Bend, Kansas, and above Fort Smith, Arkansas.*

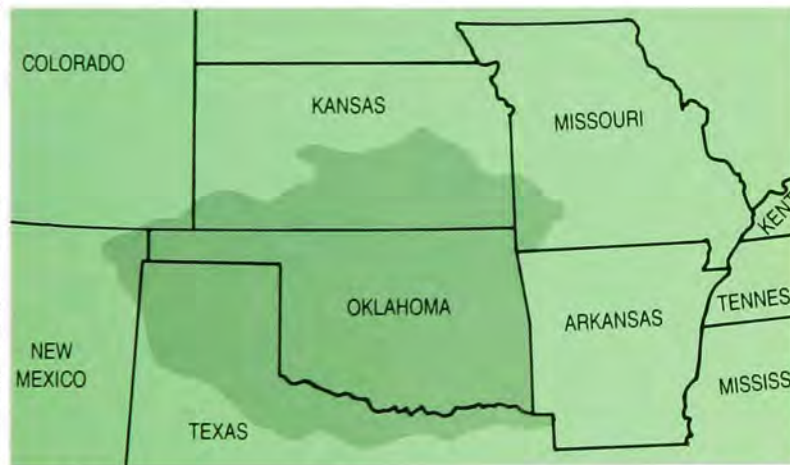
*Military work was assigned more on the basis of available manpower than geographic lines, and the Tulsa District managed construction of military facilities over a broad region throughout World War II.*



**TULSA DISTRICT 1945-1980**

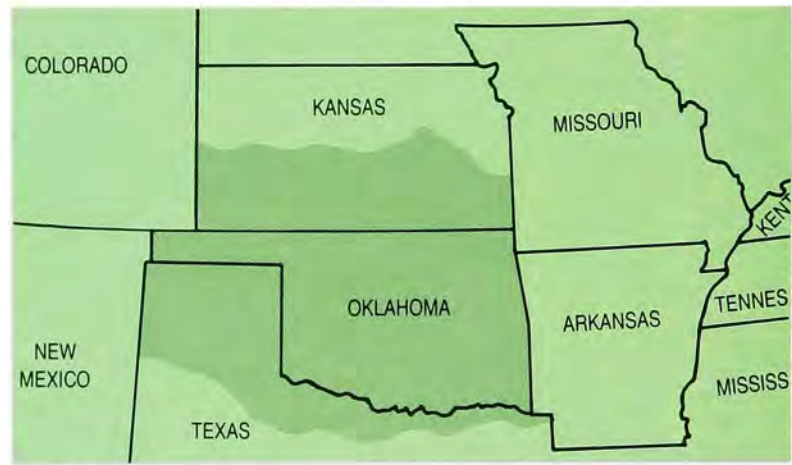
*In 1945, the marriage of the Tulsa and Denison Districts expanded Tulsa's jurisdiction over the upper Red River valley, to include the lands drained by the Red above Fulton, Arkansas. Again, military work was conducted in a*

*somewhat broader region until 1961, when the Tulsa District became exclusively devoted to civil works.*



**TULSA DISTRICT 1980-1982**

*In 1980, a relatively minor realignment removed lands in Arkansas from the Tulsa District jurisdiction. But a major change occurred in 1981 when military construction and facilities maintenance work in Oklahoma and Arkansas was reassigned to the Tulsa District.*

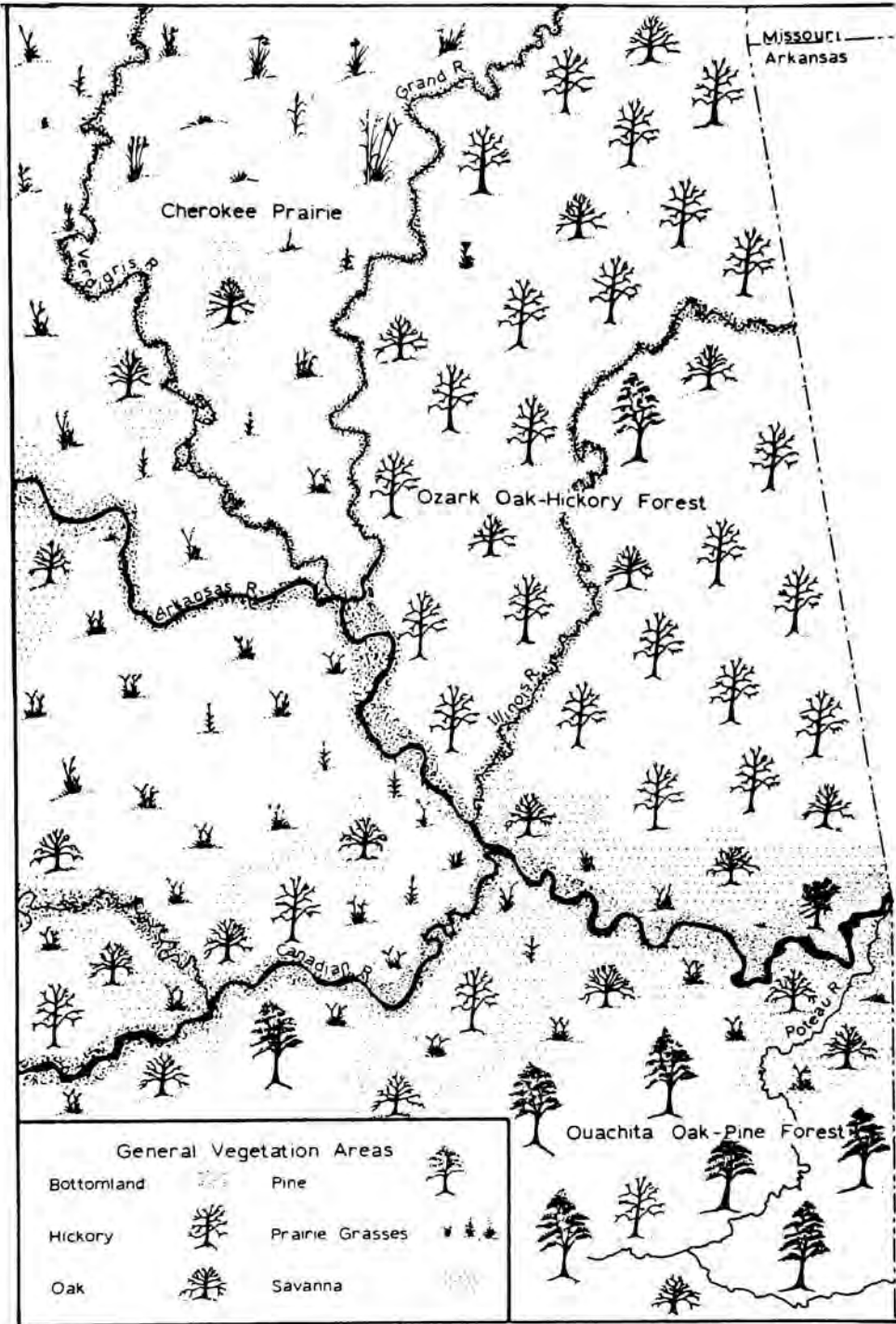


**TULSA DISTRICT 1982-PRESENT**

*In 1982, the Tulsa District territory was squared up, removing portions of Colorado, New Mexico, and Missouri from the District's civil works responsibilities. As the District rounded its 50-year mark, its civil jurisdiction thus included all of Oklahoma, roughly the southern half of Kansas, and a northern fringe of Texas including the Panhandle. Military boundaries were realigned*

*In 1985, assigning the District responsibility for facilities in all of Oklahoma and a northern portion of Texas including the Panhandle.*

*In the ever-changing lands of the Tulsa District, the woodlands meet the prairie.*



Within what ecologists call **THE ECOTONE**, the prairie meets the woodland in the Tulsa District.

The Arkansas River, born in a Continental Divide snowdrift atop the Rocky Mountains near Leadville, Colorado, slices its icy glacial waters through the Royal Gorge, drifts through the arid plains of southern Kansas and northern Oklahoma, then flows as a river of respectable scope through the rugged Ozarks of eastern Oklahoma and Arkansas, and drains, ultimately, into the Mississippi.

Meanwhile, to the south, the Red River rises on the high plains of New Mexico and flows through the wastelands of the Texas Panhandle, cuts east to form the boundary between Texas and Oklahoma, then heads southeast through Arkansas and Louisiana to its confluence with the lower Mississippi.

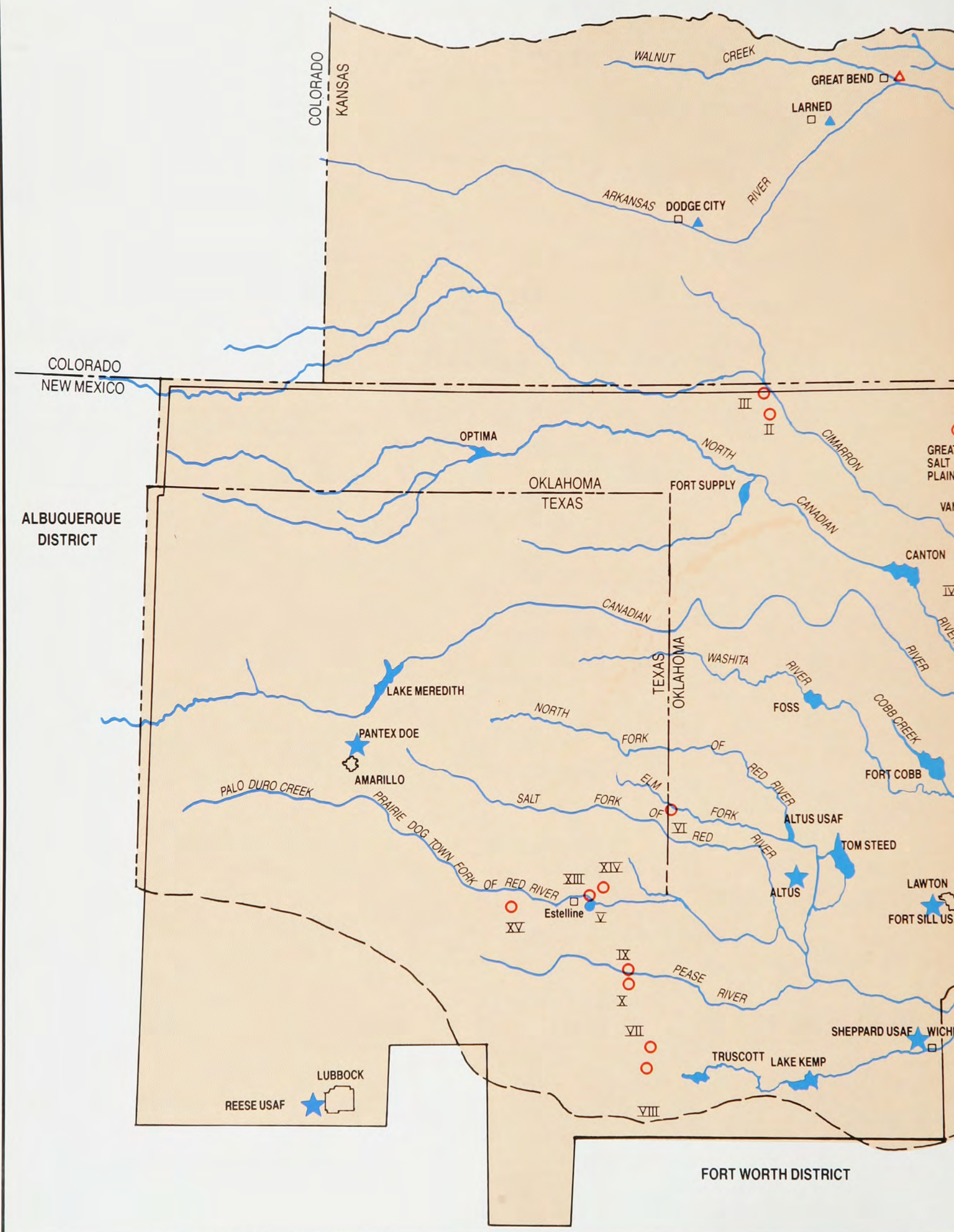
The dwellers of these lands range from the poorest backwoodsman to the most sophisticated, wealthy urbanite.

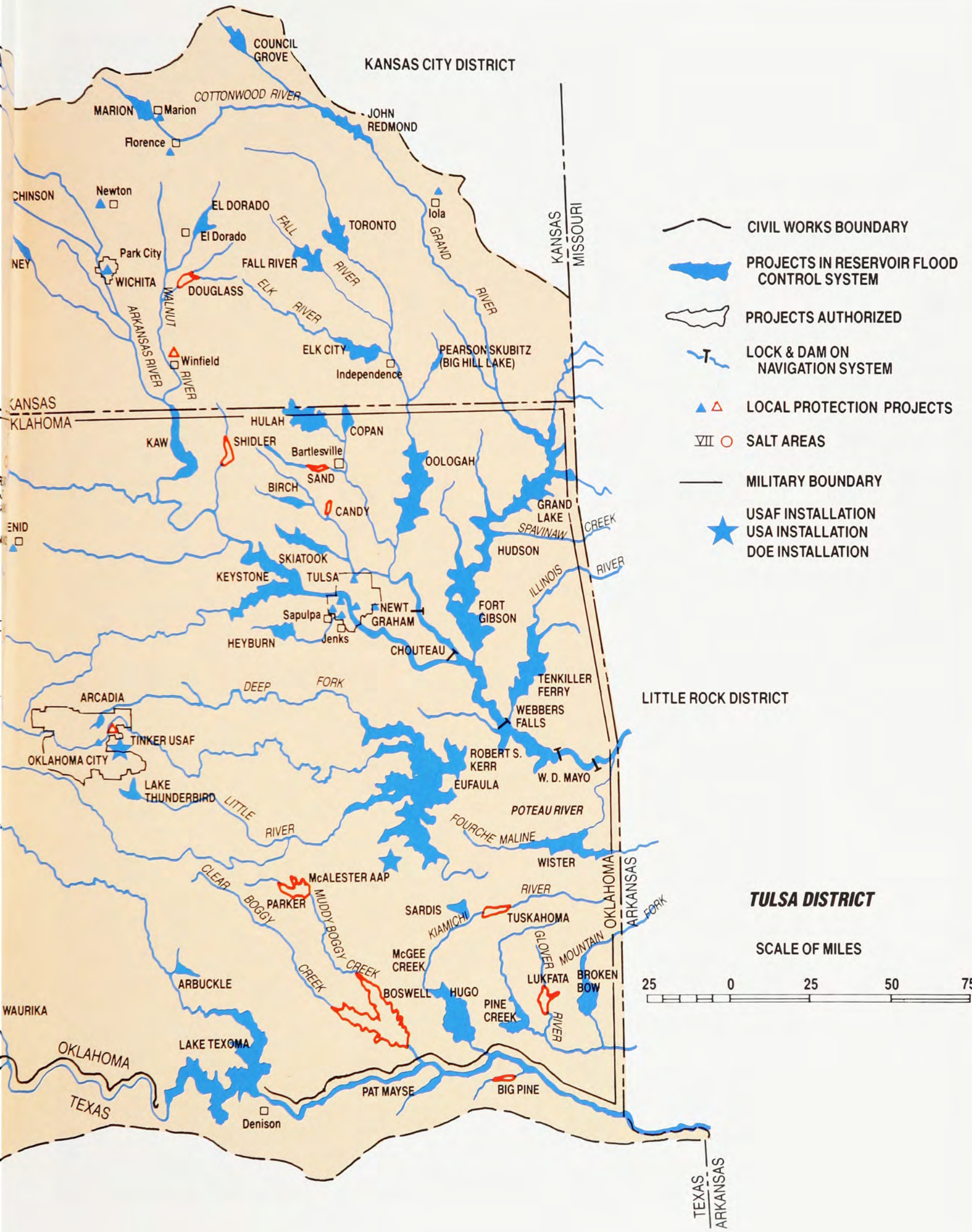
The Tulsa District has wrought stunning changes in the landscape — undulating from mountainous to rolling to flat and back to mountainous again.



And for all this,  
nature is never spent . . .

— *Gerard Manley  
Hopkins*





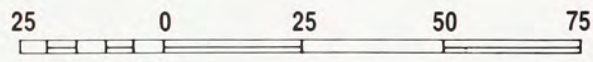
**KANSAS CITY DISTRICT**

- CIVIL WORKS BOUNDARY
- PROJECTS IN RESERVOIR FLOOD CONTROL SYSTEM
- PROJECTS AUTHORIZED
- LOCK & DAM ON NAVIGATION SYSTEM
- LOCAL PROTECTION PROJECTS
- SALT AREAS
- MILITARY BOUNDARY
- USAF INSTALLATION  
USA INSTALLATION  
DOE INSTALLATION

**LITTLE ROCK DISTRICT**

**TULSA DISTRICT**

SCALE OF MILES



TEXAS  
ARKANSAS



## LAKES? WHAT LAKES?

**T**he Tulsa Tribune's writer Roger Devlin recalls a day in the 1920s, when somebody put an outboard motor on display in a store window on Tulsa's Main Street. It was a curiosity.

"It drew a crowd because many citizens had never seen one," Devlin wrote in 1971. "I don't know how long it took to sell it because — well, even if you had an outboard back in those days, where would you have been able to use it?"

"... The Arkansas? Sometimes it flooded past its banks but usually was a muddy trickle meandering through sandbars. Grand River? No better. The Verdigris? Even worse and mostly mud.

"Lakes? What Lakes?"

"Well, there was Sand Springs Lake, reachable by the interurban. But to call it a lake was flattery... There was Big Lake — the 'Big' was a comparative term — over toward Claremore. And Yonkapin. Both were shallow ancient meanders of the Verdigris... The water was inhabited mostly by tired migratory ducks. And frogs and water moccasins.

"Lake Francis, over near Siloam Springs in Arkansas... nice even if not large enough to be on the map..."

"Lakes or real, honest-to-gosh rivers on which to boat? You had to go to Minnesota. Or Colorado..."

"Sure, we had rainfall back in those days, but what didn't soak into the soil trickled off into rivulets and creeks and eventually into drainage ditches we called rivers.

"And it was gone. Unused. Unenjoyed..."

By contrast, Devlin told of a flight over modern-day, lake-dotted eastern Oklahoma, "a water wonderland:

"Keystone, right at Tulsa's back door, was a great river-fork 'Y' of beaten silver. Hulah gleamed far to the north. There was always-surprising Oologah [and] silken-looking Gibson, Markham Ferry and Grand... Tenkiller on the Illinois and gem-like Greenleaf... Eufaula... Wister on the Poteau, [and] up north of it a huge expanse of shimmer... the Robert S. Kerr Reservoir on the Arkansas..."

"Any one of them could cradle Sand Springs Lake or Big Lake or Lake Francis in one of their smaller arms, and you'd never know it was there..."

"The amount of water this corner of Oklahoma has challenges the senses today... We've got so much water today it is hard to appreciate it, unless you had known this country before.

"You don't have to be in your dotage to recall how important to our land-locked, arid, Great Plains lives Sand Springs Lake and Yonkapin and Francis once were.

"Now they're almost forgotten as the boats-on-trailers whiz by on their way to Keystone or Grand or Eufaula."

— The Tulsa Tribune, Jan 31, 1971



**A Keystone striper, a Broken Bow reflection.**



***The sun sets on fishing at  
Birch and bicycling at  
Marion:***

**Now fades the glimm'ring  
landscape on the sight,  
And all the air a solemn  
stillness holds . . .**

**— Thomas Gray**



**Col. Harry A. Montgomery**  
July 1939–October 1942

## Chapter 3 A FLASH OF TIME



**Col. Bruce D. Rindlaub**  
October 1942–December 1942



**Col. Francis J. Wilson**  
December 1942–April 1946



**Col. Claude H. Chorpene**  
April 1946–May 1949

The rhythm of **THE CORPS' HISTORY** can be seen most clearly in a kind of time-lapse photography: an illustrated timeline that highlights events in the life of the U.S. Army Corps of Engineers and the Tulsa District.

**June 16, 1775** — Col. Richard Gridley of Massachusetts is named the Army's first Chief Engineer and begins work in the Battle of Bunker Hill.

**1800s** — Riverboat trade on the Arkansas uses flat-boats, keel-boats, pirogues or dugouts.

**Apr. 30, 1824** — General Survey Act authorizes President to use Army engineers to survey road and canal routes "of national importance, in a commercial or military point of view."



**1832** — First River Act authorizes work on Arkansas River, to maintain a channel to the mouth of Grand River, granting \$15,000 for that work.

**1890s** — Corps begins regulating US waters, primarily to protect navigation.

**1917** — Congress passes first flood control act after monumental floods in 1912 and 1913.



**1927** — Historic 1927 flood in Mississippi Valley, a national flood.

**1930s** — Dust bowl drought and the Great Depression wrack the Arkansas and Red River basins.



**July 1935** — Corps notifies Congress that Arkansas River navigation is technically — but not economically — feasible.

**1936** — Landmark Flood Control Act creates Southwestern Division and authorizes 211 flood control projects in 31 states.



**Col. Edward G. Daly**  
June 1949–October 1950



**Maj. Louis L. DeNoya**  
October 1950–December 1950



**Col. Edward G. Herb**  
December 1950–July 1953



**Col. Stanley G. Relff**  
July 1953–January 1956



**Col. William J. Himes**  
January 1956–July 1956



**Col. John D. Bristor**  
July 1956–July 1959

**July 14, 1937** — Southwestern Division begins work in a territory that includes the upper Arkansas, Red, White, and Black River basins, among others.

**1939** — War breaks out in Europe.

**Jan. 1, 1939** — Denison District is formed in the Red River basin, primarily to build Denison Dam.



**July 1, 1939** — Tulsa District is formed from Little Rock District and receives \$11 million for work on eight authorized projects.

**Dec. 1940** — Military construction for the Army Air Corps is transferred from the Quartermaster Corps to the Corps of Engineers. Thirteen months later, the Corps undertakes all construction for the Army's war efforts.

**Early 1941** — Tulsa District is building the Tulsa Aircraft Assembly Plant #3 ("the Tulsa Bomber Plant"), now known as McDonnell Douglas Corporation.

**Dec. 7, 1941** — Japanese attack Pearl Harbor, triggering US entry into WW II (1941–1945). During the war, Tulsa and Denison Districts placed \$800 million in military construction and procured special engineering equipment costing more than \$100 million.



**1940s** — West Tulsa levees and Texoma, Canton, Fall River, Wister, Fort Supply, and Great Salt Plains Lakes completed.

**1944** — Flood Control Act authorizes recreation facilities at reservoirs.

**Apr. 1, 1945** — Denison District is merged with the Tulsa District.

**July 24, 1946** — McClellan-Kerr Waterway navigation project is authorized in Rivers and Harbors Act. The plan includes hydropower, flood control, recreation, and navigation from Catoosa, Oklahoma, to the Mississippi River.

**1950s** — Heyburn, Hulah, Fort Gibson, and Tenkiller Lakes completed.



**Col. Howard W. Penney**  
July 1959–July 1962



**Col. John W. Morris**  
July 1962–June 1965



**Col. George A. Rehb**  
August 1965–November 1967



**Col. Harley W. Ladd**  
November 1967–March 1968



**Col. Vernon W. Pinkey**  
March 1968–July 1971



**Col. William E. Read**  
August 1971–November 1972

**1950–1953** — Korean conflict. Tulsa District military construction averages \$50 million a year.

**1954** — Arkansas River navigation is placed in a “deferred for further study” category. A major engineering problem needs to be solved: 100 million tons of silt flowing down the Arkansas annually could prevent navigation.

**1956** — Oklahoma Senator Robert S. Kerr wins funds for three reservoirs vital to the navigation system in return for throwing his support to the popular Federal Aid Highway Act (which authorized the interstate highway system).

**1957** — Navigation system construction begins.



**July 1961** — Tulsa District is relieved of all military construction responsibilities to re-emphasize its increasing civil works programs.

**1960s** — Keystone, Eufaula, Council Grove, Toronto, Oologah, John Redmond, Elk City, Millwood, Pat Mayse, Marion, Broken Bow, and Pine Creek Lakes completed.

**1969** — Congress approves the National Environmental Policy Act.



**1965–1973** — Vietnam War.

**Dec. 30, 1970** — Waterway is ready for use: 448 miles, 17 locks and dams.

**Jan. 21, 1971** — First tow travels full length of navigation system, arrives at Port of Catoosa carrying World and Tribune newsprint.

**June 5, 1971** — President Nixon dedicates \$1.2 billion navigation system.

**1972** — Clean Water Act extends Corps regulatory authority (Section 404 permits) to all waters of the United States.

**1974** — Congress authorizes 1% of project construction for archaeological work.

**1970s** — Hugo, Dierks, Gillham, Kaw, Birch, DeQueen, Waurika, and Optima Lakes completed.



**Col. John G. Driskill**  
November 1972–July 1975



**Col. Anthony A. Smith**  
July 1975–July 1978



**Col. Robert G. Bening**  
July 1978–August 1980



**Col. James J. Harmon**  
September 1980–August 1983



**Col. Franklin T. Tilton**  
August 1983–August 1986



**Col. Frank M. Patete**  
August 1986–

**Oct. 1, 1980** — The portion of the Tulsa District lying within the State of Arkansas is transferred to the Little Rock District.

**1981** — Tulsa District re-assumes military responsibility for four installations in Arkansas and five in Oklahoma.

**1981** — El Dorado, Big Hill Pearson- Skubitz, Sardis, Copan, Skiatook, and Arcadia Lakes completed.



**1982** — Tulsa District gives up the small pieces of Missouri, New Mexico, and Colorado and picks up the remainder of the Arkansas Basin in Kansas.

**May 1984** — Tulsa District is first in the Corps to become a model District.

**Aug. 1985** — After a November 1984 fire destroyed 17 acres of the roof of Building 3001 at Tinker Air Force Base, Tulsa District completes the \$63.5 million repairs.

**Oct. 1, 1985** — Tulsa District assumes duties for two air force bases and one DOE plant in the Texas panhandle; Arkansas military installations are shifted to the Little Rock District.



**1987** — Passage of the Omnibus water bill (first in 16 years) authorizes numerous projects for Tulsa District and heralds new era of local/federal cost-sharing partnership.

**Jan. 22, 1988** — Corps and the City of Tulsa sign a local cooperation agreement on the \$155 million Mingo Creek Flood Control Project, Tulsa. (The “Tulsa Treaty.”)

**July 1, 1989** — Tulsa District celebrates its 50th birthday.





## Chapter 4 HOME, SUITE HOMES

The people of the Tulsa District have hung their hats on a number of places over the past 50 years and called them "home."

**Wright Building**



Photo Courtesy Hopkins Photography

Photo Courtesy Hopkins Photography

**Petroleum Building**

**July 1, 1939: The Tulsa District staff set up shop here, on packing-crate desks and nail-keg chairs.**



**Tulsa Bomber Plant**

Photo Courtesy Hopkins Photography



**Tulsa Armory**



**Tulsa Chamber of Commerce Building**

Photo Courtesy Hopkins Photography



**9 East Fourth Building**



**Federal Building**

**Spring 1968: Five hundred Tulsa District employees moved into Tulsa's old U.S. Post Office and Court House. Public sentiment opposed removing the**

**deeply carved old name and substituting the sterile new name — "Federal Building" — but workers found out the letters were just glued on.**

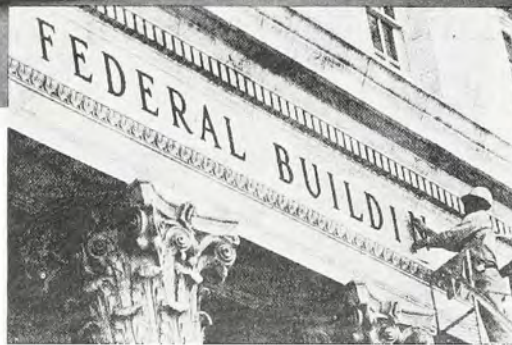


Photo Courtesy The Tulsa Tribune

**Bank of Oklahoma Tower**



**Williams Tower**



**211 South Houston Building**



## Chapter 5: THE DISTRICT IS PEOPLE

These myriad  
**FACES MIRROR  
THE EVENTS** and adventures of the past  
50 years — of the people of the Tulsa District  
and its region, diverse and hardy, keen and  
worthy.



*The Corps family at work  
and play:  
Above: topping out Sardis  
Left, clockwise from top:  
Having a ball. Hydropower  
planning. Maintaining a  
dam. Sandbagging at Tulsa  
for the 1986 flood.  
Managing hazardous waste.  
And securing an eagle roost  
for wildlife management.*





***The 1960s Accounting Department hummed in Tulsa's Chamber of Commerce Building. And Ranger Ron Heathcock rescued a lost child at Fort Gibson, 1980.***

**... Let the players be well used, for they are the abstract and brief chronicles of time.**

**— Shakespeare**





*Keystone Dam penstock dwarfed workers, 1960. Top left, Fort Gibson concrete work, 1917. Top right, laying water line, Great Salt Plains Dam, 1938.*



All work is empty  
save when there is love  
. . . When you work with  
love,  
you bind yourself  
to yourself, and  
to one another . . .

— Gibran

***Clockwise from top: Sue  
Purvis, archaeology, Marvin  
Staggs, perennial Rose  
Show winner; Angella  
Asberry, library; Denise  
Henderson, engineering;  
and Beth Holland, personnel.***





**1948: A Christmas pause brought smiles to Corps engineers at the Tulsa bomber plant, while Col. Reiff shows food gathered for the poor in 1954.**



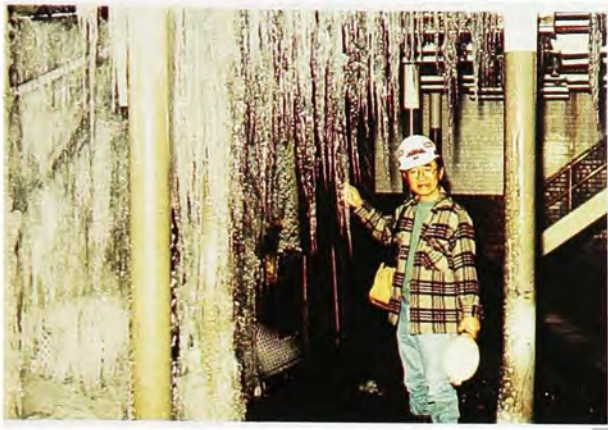
**1980s: Some participate, others watch at District events: Aerobics class members, far left below; Toastmaster Harold Billings, far left above; Western Heritage Day celebrants Velma Mullins and Phil Lutz, left; and winning athlete Lisa Lawson, above.**





**Top left: While his wife Penni looked on, Mark Fritz was honored for distinguished service; in 1985, after his untimely death, the District established a special leadership award in his honor. Col. Bening led a motley crew in the 1982 Arkansas River Great Raft Race, top right. Weldon "Bill" Gamel (right) and Col. Patete (bottom right) worked with Oklahoma Gov. Henry Bellmon in 1987, while Col. Harmon cleaned up on the Illinois River, 1982. Bottom left: The District's oldest stag social club, the Beekeepers, prepared for a 1957 feast.**





**Above right, former Corpsmen Britt Bastos, George Lempera, and Anthony Kaprelos are among retirees who gather every year for up- to-date briefings.**

**To talk of old times with old friends is the greatest thing in the world.**

**— Will Rogers**



**The Tulsa District is action, as shown in these color photos, counter-clockwise from upper left: Yes, Reggie Kikugawa, water from firemen's hoses formed ice stalactites in Tinker Air Force Base Building 3001 after the 1984 roof fire. Bob Williams and Dave Wright inspected damage after the 1979 Wichita Falls tornado. Inspectors checked construction at Arcadia Lake near Oklahoma City. Water watchers Guy Cabbiness, Marvin Fly, and Clinton Word compute in the District's highly technical Hydrologic Modeling Center. Sheila Hamilton staked out a site in the Wichita Falls tornado area, and David Mosely kept the mailroom humming.**



**At the annual Engineer Day picnic, 1986: Rick Hedrick was targeted for water balloons while Merle and JoJeanne London relaxed.**



**Contributors to this book included, left to right: top row: Bill Cheatham, Bill Austin, Beverly Leland, Barbara Cravens, and Cindy Richmond. Bottom row: Janice Orvis, Ken Gill, and Bob Freeman. Thanks also to the many others who shared memories, scrapbooks, and generous talents.**



**SECTION 2:**  
**THE ORIGIN OF THE TULSA DISTRICT**

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## Chapter 1

# A RICH BASIN OF OPPORTUNITY

*"All went well for a time, but the rains ceased to come and the weather grew hot and all the vegetation dried up. Night after night we could see the lightning flash all around the horizon, but it was only heat and not the forerunner of rain. By and by, hope failed the stoutest heart and how we were to live the long cold winter through was a problem not easy to solve. Fifteen months without a drop of rain and the country new, no surplus corn and wheat in the bins as now, made the bravest heart despair."*

— Laura Elizabeth Belts, Kansas pioneer, recalling the drought of 1860.<sup>1</sup>

Bob Kerr took

**THE LONG VIEW**, the very long view.

So, when he set out to tell the story of the state he represented for many years in the U.S. Congress, Kerr began at the *real* beginning, when the earth was without form and void: "a gaseous mass, spinning for ages in the heavens . . . (and) transformed gradually into a sphere with a rugged crust.

"Inside the crust," Kerr wrote in *Land, Wood and Water*, "water was hidden in great underground seas, in small pools, and in dripping layers between the rocks . . .

"On this still smoking planet, the rains fell for eons . . . into oceans . . . and rivers (that) pounded the rock into sand and soil until life could survive."<sup>2</sup>

### ELEPHANTS ON THE VERDIGRIS

**W**hen a fisherwoman found a curious bone near the Tulsa Port of Catoosa excavation site in May 1971, she uncovered a bit of ancient history. The discovery was reported in the Tulsa World May 23, 1971:

"Dan McPike, curator of anthropology at Gilcrease Museum [says the rock] was probably a joint of a prehistoric elephant, dating back at least 11,000 years and maybe earlier . . ., probably either a Mastodon or Mammoth, the huge, shaggy ancestors of the modern elephant.

"Most people are jarred when they hear that elephants roamed Oklahoma that short a time period ago," McPike said. He added however, that several thousand of the pachyderms wandered

the plains during that prehistoric period . . . Paleoindians, a nomadic people, lived then and hunted large game.

"They probably followed the herds and got roots, herbs and berries as they went . . .

"There are many hundreds of thousands of pieces of elephants all up and down the Verdigris and Arkansas rivers," McPike said . . . Many people have found elephant teeth . . . generally on the Arkansas River between Sand Springs and the Keystone Dam . . .

There is a very good chance, he added, that if a Paleoindian were alive today and could be compared with a contemporary Indian, "you could not tell them apart."<sup>3</sup>



. . . who knew tales of  
the early time of men,  
how the Almighty made  
the earth, fairest fields  
enfolded by water, set,  
triumphant, sun and moon  
for a light to lighten the  
land dwellers, and braided  
bright the breast of earth  
with limbs and leaves,  
made life for all  
of mortal beings that  
breathe and move.

— *Beowulf*



**Early man left his indelible mark upon the history of the region that was to become the Tulsa District.**



Photo courtesy Gilcrease Museum

Such human life that survived into the 20th century in these parts found that the oil-rich Tulsa District region was also rich in geologists, who speak less poetically than Kerr. These earthly scientists have traced the Tulsa region back to a day when only primitive sea plants and bacteria existed on earth.<sup>4</sup>

Somewhere in the vicinity of 4.5 billion years ago the region was covered by inland seaways that in time exploded into mountains. The mountains in turn were slowly nibbled away by minute bites of wind and water, then overthrown by powerful forces that folded and buried the land into underground mountains, trapping rivers, streams, and seas within the earth.

Over another landscape of time, the returning seas deposited masses of sands, clays, and lime muds that were in turn shattered by the exploding Ozark Uplift some 340 million years ago.

The restless earth tilted upward along the northern and southern rims of what would become the Tulsa District. Far to the west, the Rocky Mountain uplift raised western plains skyward. To the east, low mountains were raised by the Ozark Uplift. To the south, the rim of this earthen bowl was tugged downward by the sagging Gulf of Mexico.

Again, erosion conquered all. The persistent nibbling of wind and rain eroded the basin almost flat, allowing the return of still another shallow sea. Here roamed, scientists have found, large, shore-dwelling dinosaurs and other reptiles.

Then came

### **THE WATER WORSHIPERS.**

Streams and rivers cut across the face of the land during the past 100 million years or so, alternating periods of vigorous downcutting with quiet intervals when the stream valleys were covered by river muds and wind-blown dust.

“Primitive man,” wrote Bob Kerr, “settled along the surface streams, and so great was his awe that he worshipped them.”<sup>5</sup>

Archaeologists say prehistoric nomad tribes wandered into the area, for reasons still unknown, as early as 12,000 years ago.<sup>6</sup> Thereafter, this region was home to numerous Indian tribes hunting the great buffalo herds across the plains. Traces of their civilization are found in the mounds they



Photo courtesy Gilcrease Museum

**O you who dwell  
by many waters,  
abundant in treasures . .**

**..**

**— Jeremiah 51:13**

constructed in the eastern part of Oklahoma and the remains of irrigation ditches and pueblos in the western Panhandle section.

Most of our knowledge of these earliest inhabitants comes from the evidence gathered by archaeologists, who have pieced together glimpses of early life, often from scattered bones and tool fragments left near sites where mammoth or camel were butchered.

The nomads roamed a land that had much to commend it.

From the oak, hickory, and pine forests of eastern Oklahoma, the region stretches west through the short- and tall-grass prairies to arid and semi-arid western lands. Several ecological zones meet and overlap throughout the district's region, producing a rich diversity of plants and animals, contrasting land forms, and varying rocks and minerals.

During that earliest period of habitation (10,000 to 6,000 B.C., the PaleoIndian Period), thick glacial ice sheets extended as far south as Ohio and Indiana. The lands that today make up Oklahoma were colder and wetter then, resembling present-day Minnesota.

## **HUNTING, GATHERING, FISHING & MOUNDING.**

Warmer temperatures around 8000 B.C. brought about major changes, including the disappearance of the big game animals. The region's inhabitants during this Archaic Period adapted by diversifying their activities, wandering from place to place, and supplementing their diets with fish and gathered nuts, seeds, berries, fruits, and vegetables.

Sometime after 500 B.C., the early farmers began to cultivate crops, manufacture pottery, and use bows and arrows. They needed to stay near their crops and so began to build permanent villages where they developed complex Caddoan societies. Among their activities was the building of flat-topped temple mounds, such as those at Spiro and Harlan, for burial mounds or as platforms for important buildings and ceremonies.<sup>7</sup>

Rivers were channels for trade and communication. Sometime after 1450 A.D., for reasons not known, mound building stopped. People continued to live and hunt in the region, farming crops



Photo courtesy Gilcrease Museum

such as corn, beans, squash, and tobacco. Farming villages were scattered along many of the rivers in the area.

### **THE WHITE MAN COMETH.**

How can one explain the curious place names of the Tulsa District region? In the rough land of the cowboy and Indian, why do rivers bear such elegant names as Grand, Verdigris, Illinois, Poteau, San Bois, and Fourche Maline?

Those old-world French names derive from a twist of fate about the time William Penn was founding Pennsylvania, 1680, when Spain was losing a centuries-long battle for dominance of the central and lower Mississippi Valley.

In search of riches, Spain's Francisco Coronado and Hernando DeSoto had wandered through the area in 1540 and claimed ownership for Spain. But LaSalle challenged that claim. And in 1682 he won, asserting title for France and assuring a succession of French-derived names throughout the area.

It is also no accident that the rivers, particularly, bear French names. From their earliest entrance into this continent, the French preferred using rivers and waterways as highways for their explorations and commercial travel. Others might hack their way by trail through forest and mountain, but French explorers made their entrance into the Tulsa District region by water. Indeed, as early as 1719, Jean-Baptiste B'enard entered present-day Oklahoma via the Red River.

B'enard traveled cross-country to the Arkansas River. Here, according to Historian William Settle, the explorer came upon a "rendezvous with 7,000 Indians of the Wichita Confederacy . . . (where) he was told that the Acansa (Arkansas) was their river."<sup>8</sup> (At a ratio of 7,000 Indians to one French explorer, one can assume that B'enard conceded the point.)

Other French explorers came upstream into Oklahoma to trade for pelts, traveling in pirogues, canoes hollowed from cottonwood trees, and occasionally various types of keelboats.

In 1803, for three cents an acre and reasons that had to do with his political and economic distress, Napoleon sold to the United States the great province of Louisiana. The boundaries were as uncertain as Napoleon's logic and were then known only to encompass more than 800 million acres covering the western half of the Mississippi Valley, running vaguely off to the Rockies. With that \$15 million purchase and the 1848 treaty after the Mexican War, the lands that now comprise the Tulsa District came into the American Republic.

### **A RED ISLAND**

**IN A WHITE SEA.** Before the Louisiana Purchase, a vast region encompassing northeastern Oklahoma, northern Arkansas, southwestern Missouri, and southeastern Kansas was considered the domain of the aggressive and warlike Osage Indians.<sup>9</sup>

Like a white wave, western migration moved across the land in the early 1800s — and generally stopped abruptly at the western edge of Arkansas and Missouri. Into that Indian land that came to be known as the territories, President Jackson determined to move Indians, massively and forcefully, from the eastern United States.

The first quarter of the 19th Century brought scattered repopulation of the area, with trading posts, military forts, and missions springing up west of the Arkansas and Missouri lines.

Trade flourished along the Arkansas River as far upstream as the historic Three Forks area — the confluence of the Grand and Verdigris Rivers with the Arkansas near Fort Gibson and Muskogee. It was also considered the upstream limit of easy river traffic up the Arkansas.

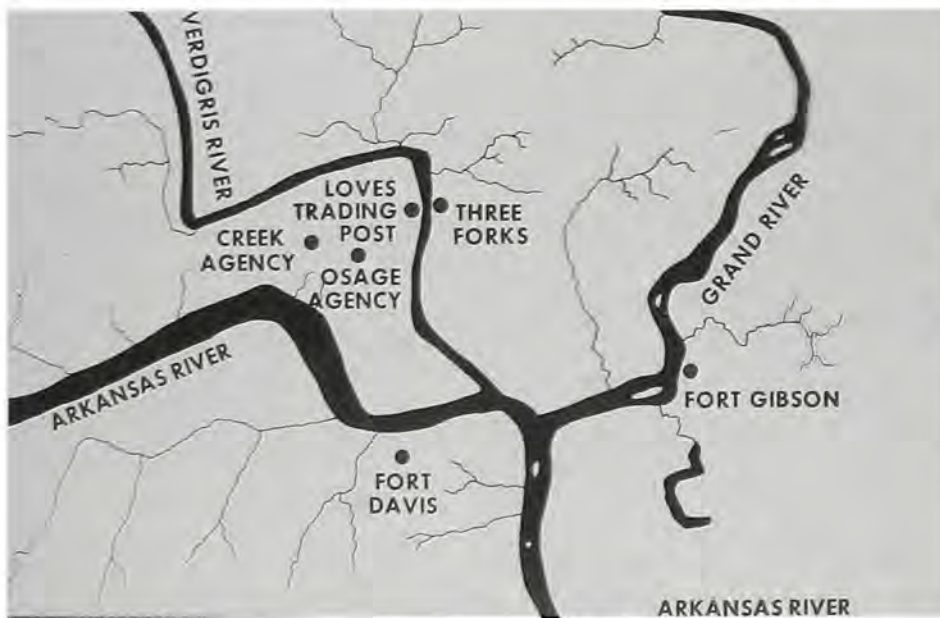
By 1844, the government reported that 60,000 Indians lived in the territory, nearly all eastern Indians who had been transported there. (By comparison, the 1980 census reported that about 100,000 Indians lived in present-day Oklahoma.)

The Five Civilized Tribes (Cherokee, Creek, Choctaw, Chickasaw, and Seminole) were among many who transported the Southern planters' way of life to Indian Territory. The five tribes had their own systems of government. An agricultural economy evolved, supplemented by forest products, and trade developed between the tribes and outsiders.

"In those days," recalled Creek Chief Pleasant Porter, ". . . we had little farms, and we raised patches of corn and potatoes, and poultry and pigs, horses and cattle, and a little of everything . . . They were all prosperous and happy and contented in their way, and what more could they want?"<sup>10</sup>

Government treatment of the tribes worsened after the Civil War, when the five tribes were punished for their alliance with the Confederacy. Indians were forced to turn over half their land holdings to the government for settlement by whites and other Indians being removed from Kansas, Nebraska, and elsewhere.<sup>11</sup>

With the end of slave ownership, however, Indian families brought in whites to farm as sharecroppers, and laborers were admitted to Indian Territory to work coal mines opened by the Choctaw Nation. By the late 1800s, the region was well on its way to diversity.



***The historic "Three Forks" area, rich bottomland at the juncture of the Arkansas, Verdigris, and Grand Rivers, lured earliest man and settlers to the region.***



## Chapter 2

# ENTER THE ARMY ENGINEERS

*"Your old men shall have dreams,  
Your young men shall see visions."*



**The Corps of Engineers traces its roots back to 1775 in the bloody Battle of Bunker Hill, when George Washington hired his first military engineer. Pioneering peacetime work, Corps' topographers followed explorers Lewis and Clark, charting the vast mysteries of the Louisiana Purchase.**

The Corps was

### **COMING OF AGE**

in the United States as events unfolded in the Red-Ark basins and Indian Territory.

Army engineering in this country is, after all, older than the United States. The first Army Engineer, Richard Gridley, was hired (for \$60 a month) by General George Washington to direct fortifications in the Battle of Bunker Hill, June 16, 1775.

The Tulsa District, born more than 160 years later, is a product of the Corps' evolution over the years, as the nation broadened the Engineers' mission far beyond the military work for which Congress created them.

After the Louisiana Purchase, the newly acquired wilderness had to be charted. The government turned to its Army engineers, augmented by civil workers such as explorers, surveyors, and map-makers. The government established a corps of official explorers who were nicknamed "topogs" — topographic engineers — within a peacetime Army after the War of 1812.

Following such explorers as Lewis and Clark, the Corps' topogs surveyed a national network of internal improvements that became the framework for the expanding new nation: waterway canals, roads, and eventually railroads.

One lesson learned from the War of 1812 was that the country needed an improved defense and transportation system, including rivers, harbors, and roads. In 1824, Congress accepted the recommendation of John C. Calhoun, then Secretary of War. It directed the Corps to improve waterways and navigation "of national importance, in a commercial or military point of view."

By 1900, following years of waterway development, the Corps' leadership in navigation was well established. By 1890, the Engineers had begun regulating United States waters, primarily to protect navigation activities. At the turn of the century, the Corps was authorized to design an integrated system of interconnected waterways along the Mississippi and its major tributaries, as well as other inland areas and coastal harbors.<sup>1</sup>



**Fort Gibson, established in the early 1800s, was among the first outposts in the region. Railways stretched into the territories along routes laid out by early surveyors.**



## **MILITARY FORTS**

**IN INDIAN TERRITORIES.** Meanwhile, the era after the Louisiana Purchase of 1803 brought the U.S. Army and its engineers into the Indian Territories region, initially for defense. Fortifications and roads began appearing: Fort Smith, overlooking the Arkansas (1817); Fort Gibson, on the Grand and Arkansas Rivers, and Fort Towson, near the Kiamichi River (1824); and a major military road linking Forts Smith and Gibson (1827).

Land-based transportation routes augmented the waterway system that was the hub of the region's commerce. Most of the river traffic traveled on the Arkansas and Red Rivers, but only during seasons when they carried enough water for navigation.

By the mid 1800s, Fort Gibson and the whole Three Forks region bustled with trade serving the Indian Nations. Flatboats and keelboats were towed, warped, poled, and rowed along the natural flow of the Red-Ark waterways as far as water depth allowed.

## STEAMBOATS

**ON THE ARKANSAS.** The transportation equation changed on March 31, 1820, when the *Comet*, the first steamboat to enter the Arkansas, arrived at Arkansas Post. It had left New Orleans a mere 18 days before.

The *Comet* was followed in short order by other steamers, including the *Eagle*, the *Robert Thompson*, the *Florence*, the *Velocipede*, the *Scioto*, the *Catawba*, the *Highland Laddy*, and the *Facility*.

"The heyday of this river traffic was the 1840s and 1850s," Settle wrote, "when 22 landings between Fort Smith and Fort Gibson could be counted."

Since 1832, Congress had been appropriating limited funds to improve navigation in the region. The River and Harbor Act of that year authorized Army Engineers to maintain a channel in the Arkansas to the mouth of the Grand. They were granted \$15,000 to do the job. Intermittent funds were later granted for snagging, dredging, modifying channels, removing bars, and building revetment works. High water often washed away the benefits from these activities.

The earliest report of a Corps of Engineers survey on the Arkansas was submitted to Congress in 1870. Engineer S.T. Albert reported that steamers carrying 700 tons could reach Fort Smith during winter months and during the June rise. Above Fort Smith to Fort Gibson, the narrow channel was obstructed by snags that largely precluded travel of anything other than small steamers carrying about 300 tons. Albert reported that more than 25,000 tons annually was shipped through Fort Gibson, including more than \$5 million in dry goods, groceries, hardware machinery, tobacco, lead, and coal.



## **KATY BEGINS**

**THE END.** On the Red River above Fulton, navigation was possible but difficult, largely because the grandfather of all log jams — called “the Great Raft” — blocked and dammed the river.

On the Red in high water, navigators could reach as far upstream as the mouth of the Washita River. In 1832, a peak year, 32 landings were logged above Shreveport.

By 1873, the Engineers had succeeded in driving a channel through the Great Raft. In anticipation of opening the river for navigation, land speculation boomed at Paraclifta, an ante-bellum center in the southwest corner of Arkansas.

But irony prevailed. On Christmas Day, 1872, the Missouri, Kansas, & Texas Railroad ran its first train into Denison, Texas. The Katy had completed its line from the north across Indian Territory, bringing the beginning of the end to steamer travel.

River travel faced overwhelming competition from railroad building that surged in the region. This resulted in declines in river traffic and booms in economic development and population along the new railroad routes.

On that 1872 Christmas Day, Katy closed the door on significant river trade that was not to be opened again in the region for 100 years.

*People could ride free, but horses and buggies were charged a nickel fare to ride the Arkansas River ferry at South Denver Avenue, Tulsa.*



**Steamboat in the Arkansas River snags.**



Photo courtesy of History Division, Corps of Engineers

## THE BUSY LITTLE RIVER STEAMERS

**S**teamboats on the Arkansas?

Yes. In the years after the War of 1812, steamers puffed their way from New Orleans and St. Louis against the mighty currents of the Mississippi and up the Arkansas, opening the region to commerce and travel heretofore unthinkable.

The Army Engineers were charged with keeping the routes cleared through such snagging and clearing operations as could be conducted with limited funds.

"The life of the busy little river steamers was a precarious one," wrote historian Grant Foresman. "[S]nags, fires and boiler explosions claimed them nearly all sooner or later; few were permitted to wear out in the service."<sup>2</sup>

"These early steamboat captains were as adventurous as the hardy pioneers who were then beating back the wilderness in their struggle to establish themselves," wrote Floyd Clay.<sup>3</sup>

"The rivers were capricious, indolent, raging, turgid, peaceful, and ominous, according to the whim of nature, but the captains took them on with amazing success. As in a cat-and-mouse game, captains eyed currents with nervous concern, and took the most logical chances. To miscalculate was generally disastrous."

Navigation, according to Settle, was possible only when there was sufficient water in the unpredictable streams.

"Especially constructed boats of 75 to 150 tons burden that required the smallest possible draught still had difficulties. The shallow rapids at Webbers Falls and the Devil's Race Ground, 17 to 20 miles below Fort Gibson, were particularly hazardous, requiring skill to navigate in addition to favorable water conditions. Delays were frequent due to low water, boats running aground on sandbars, or hitting snags, concealed rocks, and trees floating under the surface."

But even with such difficulties, steamer travel was luxurious when compared to land travel in a region where roads were generally instruments of torture.

A missionary among the Creeks compared a 600-mile horseback ride into Indian Territory in 1841 on "that most miserable wagon road" to his relatively comfortable six-week steamer trip on the Arkansas the following year:

"On the evening of the 8th of February our little steamer left the red and brackish waters of the Arkansas and entered our own little river the deep and clear and beautiful virdigris [sic].

"As she hastened over the short distance of four miles to the head of Navigation, carrying us swiftly to our destined home, the Creeks, in considerable numbers, made their appearance along the bank to gaze on the scene . . ."<sup>4</sup>

## CONQUERING THE GREAT RAFT

**F**rench explorers, venturing off the Mississippi River via the Red River to gain access to the Midwest, encountered a log jam that was already centuries old. This incredible natural pileup was important enough in engineering history to merit its own capitalized name.

*It was called the Great Raft.*

*The jam began at the mouth of the river and grew over hundreds of years as each rain upstream washed down new timber. By the 1800s the log jam extended upstream more than 100 miles and backed up dammed water still another 65 miles.*

*Navigators as early as 1719 learned to skirt The Raft by crossing the flooded prairies through impounded water.*

*Throughout the middle years of the 1800s, Army Engineers worked to drive a temporary and then a permanent channel through the jam. They worked at their task, beset by mosquitoes "like huge gray clouds," as well as the accompanying yellow fever that felled many.*

*When a permanent channel was finally secured in 1873, the work was acclaimed as one of the great engineering feats of the 19th Century.<sup>5</sup>*

**Snags, snares, and log jams: river travel on the Arkansas and Red Rivers was a treacherous affair.**



Photo courtesy U.S. Military Academy Library



## Chapter 3

# THE BIRTH OF THE TULSA DISTRICT

*"This dusty old dust is getting my home,  
And I've got to be drifting along."*

— Woody Guthrie

if the

### NUMBER ONE PEACETIME BUSINESS

of the Army Engineers in the 1800s was navigation, the number one problem in that business was flooding. But it took time to understand the interrelationship fully.

Following ravaging floods along the Mississippi River, Congress in 1850 handed the Corps of Topographical Engineers a major challenge: to develop a practical plan for flood control and navigation at the Mississippi's mouth.

Thus the Corps undertook the first comprehensive analysis of topography and hydrology ever conducted for a major river basin. This study, and a companion study by civilian engineer Charles Ellet, disagreed on the best approach to controlling floods— levees or reservoirs. In 1861, a larger report submitted by Topographical Engineers Andrew A. Humphreys and Henry L. Abbot discredited Ellet's reservoir approach and effectively instituted a levees only policy that dominated the Corps into the 20th century.<sup>1</sup>

In 1917, after disastrous floods in 1912 and 1913, Congress passed the first major flood control legislation, appropriating \$45 million for Mississippi levees work by the Secretary of War. In fact, over the years from 1882 to 1926, \$300 million would be invested in levees along the lower Mississippi River, including \$162 million in local bonds that Kerr insisted were still being paid in 1960.<sup>2</sup>

The "levees of lakes?" debate erupted again after a catastrophic flood hit the lower Mississippi in 1927. More than 300 died, property damage was in the millions of dollars, crops were destroyed, towns were flooded, thousands were homeless, and large portions of the entire Mississippi Valley were inundated. Half the state of Arkansas was under water because of flooding along the Arkansas River.<sup>3</sup>

**And the rains descended,  
and the floods came . . .**

— Matthew 7:25



IF YOU SEE IT IN THE  
**WORLD**  
YOU KNOW IT'S TRUE

# TULSA WORLD

MORNING EDITION

Average Daily News Circulation  
**3,386**  
For the Month of April

SOLE PAPER IN MID-CENTURY OIL, GAS AND COAL BELT WITH FULL ASSOCIATED PRESS REPORT

VOLUME 22, NUMBER 214

TULSA, OKLAHOMA, SUNDAY MORNING, MAY 20, 1912

FIVE CENTS PER COPY

With the Abundance of Moisture That Old Man Pluvius Continues to Send Along, the Oklahoma Farmer Promises To Be Blest This Year With the Greatest Crops In Its History

## FLOODING RAINS

WILDEST SUMMERS ALMOST  
THE ENTIRE STATE

## RAILROADS ARE TIED UP

Western and Western branches  
Reported in Every State—Ear-  
ly Rainfall in Oklahoma.

With nearly every railroad being  
out of Tulsa partially submerged and  
some more abandoned and others  
have been closed, telegraph wires  
down and telegraph wires required at  
least twice, between submerged and  
submerged of Tulsa branch to prop-  
erty in and about Tulsa, the effect  
being that Tulsa is almost entirely  
isolated from the rest of the state.

From the surrounding country, the  
people of Tulsa are being rescued  
and the railroad is being repaired  
and the telegraph wires are being  
repaired. The Tulsa branch is  
being repaired and the telegraph  
wires are being repaired. The Tulsa  
branch is being repaired and the tele-  
graph wires are being repaired. The  
Tulsa branch is being repaired and  
the telegraph wires are being repaired.

## TULSANS AT HOME AND ABROAD



## HANNA STATUE

GRANT TO THE MEMBERS OF THE  
GREAT OCEAN

## TAFT AT THE UNVEILING

Secretary of War William H. Taft  
Arrives, Followed by Groups of  
New Jersey, Groups of the Day

Covered, May 20. — With the  
celebrated men in question, an im-  
mense crowd of spectators and digni-  
taries gathered at the unveiling of the  
statue of Hanna, a bronze statu-  
e of United States Senator Hanna  
A. Hanna was today unveiled by the  
Governor, Mrs. John Hanna, Secre-  
tary William H. Taft, former  
United States Attorney General J.  
W. Griggs, William Hanna, grand  
Aunt of the Statuette of Hanna,  
Civil Engineers, former Governor  
John T. Stewart, additional additional  
sculptors of the Statuette of  
Hanna.

## GAR READY TO DEPART

General Grant Will Depart Monday  
Morning at 10:00 A.M.

## AIRSHIP BURSTS

SIXTEEN OCCUPANTS KILLED  
IN BARRAGE AND ALL DE-  
STROYED

## RESTRICTIONS BILL

WARRANT AFFRONTED UNLAWFUL  
LEADS FARMER THE  
SUCRAL

## TO CONFER FURTHER

CONGRESS FAILS TO ASSESS ON  
POST OFFICE APPROPRIATE  
TICK BILL

## AIRSHIP BURSTS

SIXTEEN OCCUPANTS KILLED  
IN BARRAGE AND ALL DE-  
STROYED



The Corps' number one  
peacetime problem was  
flooding, such as (bottom  
row, far left): the 1904  
floods at Halstead and on  
the Walnut River in  
southeastern Kansas, and  
(near left) Bartlesville's  
1912 flood. Above, Tulsa  
World cartoons poked  
gentle fun at the political  
possibilities of the 1908  
flood.

## **THE WICHITA**

**FALLS MODEL.** Among those testifying before Congress after the 1927 flood was Ernest E. Blake, an Oklahoma City lawyer and former Ohio River steamboat pilot. Blake was also chairman of an interstate commission promoting control of the Arkansas and Red Rivers.

Interest was high in the region, in part because disastrous floods had struck Oklahoma in June and October of 1923. The Canadian River shattered Oklahoma City's water supply dam. In Tulsa the Arkansas destroyed the city waterworks and drove 4,000 from their homes. Nearly every wagon and railroad bridge in central Oklahoma was washed out, according to Kerr. Blake proposed building reservoirs on the Arkansas and Red Rivers, contending that they would catch one-third of the run-off from any storms and prevent serious flooding downstream.

"The 1927 flood on the Arkansas, the greatest ever known, came out of a little area here in southeastern Kansas," Kerr recalled that Blake told Congress. "The little stream of Walnut Creek poured about seven hundred thousand acre-feet of water into the Arkansas River at one time and caused a record stage in the Arkansas . . . . The control basins of northeast Oklahoma, as we have proposed, would have a capacity of between three and four million acre-feet of water. Had these been installed at the time, there would have been no flood in the Arkansas River."

Kerr wrote that Blake took a second, giant step forward with his recommendations: he proposed the novel concept of an all-purpose reservoir that would contain water for flood control, irrigation, fish and game, recreation, municipal water supplies, and electric power generation. Blake knew of no such reservoirs, but he mentioned a small, local lake near Wichita Falls, Texas, that came close to his idea. It gave the town its water, was irrigating 40,000 acres of land, and helped control flooding.<sup>4</sup>

### **NAVIGATION? NEVER!**

*The idea that the Arkansas River could be made navigable above the mouth of the Grand River was an item of hot debate in the early 1900s.*

*Official policy was divided. On the one hand, Congress had appropriated funds in the 1870s and 1890s for a project as far upstream as Wichita, which would make the stream legally fall under the category known as "navigable." <sup>5</sup>*

*On the other hand, sand bars cannot float ships, and the mouth of the Grand had long been considered the head of Arkansas River navigation. <sup>6</sup>*

*So when the United States Attorney General needed to know, an 18-month-long argument by mail ensued. One conclusion was reported in The Daily Oklahoman, Dec. 16, 1915:*

*"The only way to make the Arkansas river navigable above the Grand river would be to build a canal with cement bottom and sides and fill it with filtered water.*

*"This emphatic opinion was read into the record in the legal contest for control of the valuable oil and gas deposits under the Arkansas river at the hearing Wednesday before Judge Cotteral in the federal court.*

*"It is the opinion of Brigadier General W.L. Sibart of the war department, who was once in charge of the government engineering station at Little Rock.*

*"Many pages of General Sibart's opinion as to the condition of the stream were introduced by the government as evidence in support of its assertion that the stream is not navigable above Fort Gibson . . . .*

*"By their testimony the government sought to prove that the river, lacking sufficient water and containing a rolling mass of sand, is not and never has been available for practical purposes for river traffic . . . ." <sup>7</sup>*



RELIABILITY-CHARACTER-ENTERPRISE

THE MORNING

OKLAHOMA'S GREATEST NEWSPAPER

TULSA **WORLD** FINAL EDITION

WEDNESDAY, JUNE 21, 1929

PRICE 5 CENTS

# CITY WATERWORKS CLOSED BY FLOOD

## First Pictures of Tulsa's Worst Flood

### DESPERATE EFFORTS MADE TO SAVE POWER-FIRE PERIL THREATENS

Arkansas, Rising at Rate of Two Inches an Hour, Reaches 13.5 Feet With Prospects of Reaching 21 Feet With 24 Hours

**BULLETIN**

At 1:10 o'clock Wednesday morning, the city waterworks went out of operation, being forced when the Arkansas backed up into the bridge across and just west of the dam.

The city was left at the mercy of fire, with only two fire engines in the vicinity of Ozone park pumping water into the city main, thus providing a little water in some places.

To add to the distress, there was imminent danger of the Oklahoma Power company's plant being flooded and leaving the greater portion of the city without power and light.

Several fire men were frantically working to throw up a barricade to prevent the flood water from getting into the power plant. Outside of the company yard it could be seen that the water had risen to the level of the roof of the building, and the plant was in imminent danger of being completely submerged.

The fire department had a very hard time at night, with the water level at 18.2 feet, and it was anticipated that the water would reach 21 feet at 11 o'clock.

There was reported to Arkansas to reach 21 feet within the next 24 hours, and it was estimated that the city would be completely submerged by the time the water reached 21 feet. At this point, the city was in a very serious situation, and it was feared that the city would be completely destroyed.

The city officials were very anxious to get the waterworks back in operation, and they were working hard to get the water level down. They were also trying to get the power plant back in operation, and they were working hard to get the power plant back in operation.



*Widespread flooding in 1923 destroyed waterworks in Tulsa and Oklahoma City, wrecked transportation systems, left thousands homeless, and spurred citizens to lobby the Corps for flood control.*



**Pawhuska, 1923**

Among others testifying was Oklahoma humorist Will Rogers, who said the Army Engineers, with the traditional levee plan, were just trying to put side boards on the river.<sup>8</sup>

Congress took the lead. In 1927 it directed the Corps to conduct a sweeping scientific survey of the nation's rivers. In what were called "308 reports," the Corps studied U.S. navigable streams to develop plans for improving navigation, water power, flood control, and irrigation.

But after the investigations, the Corps concluded in 1935 that many of the proposed reservoirs on Mississippi tributaries would not be cost-effective under that day's standard. The Corps recommended no action.

The Corps' no-action action torched a political explosion, doubly hot because the country was in the midst of the Great Depression when public works were more and more appealing as a means of employment.



## THE GREAT 1927 FLOOD

**B**ob Kerr vividly recalled the awesome 1927 flood, which revolutionized U.S. water resources policy:

*"The spring night was quaking with ominous sounds. Thunder exploded and boomed over the valley. A driving rain hammered impatiently on roofs and windows and dripped from eaves. There were hoarse shouts of men and frightened cries of children and animals. But most terrifying of all was the roar of the river. It was like no other earthly sound except perhaps that of a stampeding herd of buffalo.*

*"Vivid flashes of lightning lit the black night. Several hundred men, women, and children, driving livestock before them, were fleeing from the river bend town of Hickman, Kentucky. Here was a tousled boy crying as he pulled a reluctant calf. There a car had broken down and a woman stared at it with frantic indecision while her three small daughters tugged at her skirt. A wagon piled high with furniture creaked along pulled by mules. An old man hobbled by with a cane.*

*"Close by the river a thousand men toiled along a ten-mile stretch. Here the sloping levee built to hold the Mississippi River from the lowlands towered above fields of corn stubble. Guards paced back and forth watching anxiously for danger signals: water seeping through, or 'sand boils.'*

*"... At sight of one of these, a guard would shout hoarsely and wave a flare. Others would whip up the mules and bring sandbags to throw against the*

*threatened spot. All this in a drenching downpour.*

*"The time was April 15, 1927, the year of the Great Flood . . . .*

*"Floods coursed, reckless and muddy, through all the channels that fed into the Mississippi. On the Arkansas River, which drops with sudden great jumps and then slopes gradually, the tail of the flood caught up with the head. The flood level was the highest in ninety-nine years . . . .*

*"The immense force of the river was too much. On April 16, the Dorena levee (at Hickman) broke and a tremendous wall of water crashed through with a roar that could be heard for miles . . . . The next day, St. John's levee a few miles downstream on the Mississippi cracked. The river was swirling past Memphis now at two million cubic feet a second . . . . Down the course of the turbulent river, the levees fell apart.*

*"Two-fifths of the United States' lowlands were flooded or threatened. The Mississippi Valley was itself a vast reservoir. A yellow sea stretched a thousand miles from Missouri to the Gulf of Mexico and was fifty to 150 miles wide. Seven-hundred thousand people were driven from their homes . . . .*

*"On April 22, New Orleans was in a panic. The flood was rushing upon it now at more than three million cubic feet a second. A tough decision was made. A levee fifteen miles north of New Orleans was dynamited to divert water from the city. This man-made flood drove hundreds . . . from their farms . . . ."*<sup>9</sup>

***The Great 1927 Flood:***

**It was a river that I could  
not ford,  
for the water had risen. .**

**— Ezekiel 47:5**





Photo courtesy History Division, Corps of Engineers



## GRAPES OF WRATH

**J**ohn Steinbeck recalled the dust bowl:

*“To the red country and part of the gray country of Oklahoma, the last rains came gently, and they did not cut the scarred earth . . .*

*“In the last part of May the sky grew pale and the clouds that had hung in high puffs for so long in the spring were dissipated. The sun flared down, . . . the surface of the earth crusted, a thin pale crust, . . . and in the water-cut gullies the earth dusted down in dry little streams . . .*

*“Every moving thing lifted the dust into the air: a walking man lifted a thin layer as high as his waist . . .*

*Now the wind grew strong and hard . . . Little by little the sky was darkened by the mixing dust, and the wind felt over the earth, loosened the dust, and carried it away . . .*

*“The dawn came, but no day. In the gray sky a red sun appeared, a dim red circle that gave a little light, like dusk . . . Men and women huddled in their houses, and they tied handkerchiefs over their noses when they went out, and wore goggles to protect their eyes . . .*

*“In the morning the dust hung like fog, and the sun was as red as ripe new blood. All day the dust sifted down from the sky, and the next day it sifted down. An even blanket covered the earth . . .*

*“The men sat in the doorways of their houses; their hands were busy with sticks and little rocks. The men sat still — thinking — figuring . . .”*

— The Grapes of Wrath<sup>10</sup>



***The devastation of floods was compounded in the 1930s by the disaster of drought.***

## **AND THEN — THE DROUGHT.**

As if floods and depression were not enough trouble, along came the dust bowl.

“Searing droughts,” wrote Kerr, “. . . burned the fields all across the Southwest from Oklahoma to California. Hard drought had first struck the West’s farmers in 1890 (when settlers turned to farming the southern plains after the great blizzard of 1886 killed many cattle). From then on, the western frontier of America moved back and forth according to the rainfall.”

The floods and dust storms resulted from related causes, Kerr believed, as fragile hillsides were turned to crops without sufficient care for topsoil and run-off protection.

“Before the white men came,” Kerr wrote, “Oklahoma’s western prairies, central rolling hills, and eastern meadows and forests had a thick layer of spongy soil. This soaked up much of the rain, and allowed the rest to flow into deep creeks and rivers.

“Then came the moldboard plow.”

Beginning in 1930, the dust bowl region — parts of Texas, Oklahoma, New Mexico, Kansas, the Dakotas — experienced nine dry years. The worst was 1936, when rainfall totaled less than 23 inches average across Oklahoma. There was hardly a lake in the state, except small-town water supply lakes.<sup>11</sup>

“By the spring of 1931,” Kerr wrote, “plows had broken most of the land in the southern plains . . . That summer the rain did not fall . . . There was a dryness in the air that got into your mouth and eyes and stung your face. For seven years the curse of drought struck the Great Plains. The dust storms began in the cheerless autumn of 1933 and blew for five years . . . Millions of acres were damaged. Some fields became sand dunes. Thousands of farmers, beaten by hard times, drought, and dust storms, wearily left the plains.”<sup>12</sup>



From this multi-origin misery, multiple changes occurred. The Corps reversed its policy on a number of flood control projects. In revised reports, it concluded that construction was justified by the need for public work relief and the suffering caused by recurring floods. Even more dramatic policy changes lay ahead.

“Little less than an economic and environmental revolution,” said Settle, arose in the region after many forces were united by “the floods of the 1920s, 1930s, and 1940s in the Arkansas and Red River basins; the hot, dry years of the 1930s; and realization of the inadequacy of the industrial development.”

### ***THE HISTORIC 1936 FLOOD CONTROL ACT.***

National flood control policy reached a true watershed point when Congress passed the 1936 Flood Control Act, which made sweeping changes in policy.

It established flood control as “a proper activity of the federal government” in cooperation with state and local governments.

It assigned the Corps chief responsibility for federal flood control measures.

It authorized 211 flood control works in 31 states, at \$300 million cost.

And it established the practice of multipurpose planning. This meant that federal river basin development would include flood control, hydropower, soil conservation, navigation, and water supply. By this action, it increased the factors used to determine economic benefits.<sup>13</sup>

[PUBLIC—No. 738—74TH CONGRESS]

[H. R. 8455]

AN ACT

Authorizing the construction of certain public works on rivers and harbors for flood control, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

DECLARATION OF POLICY

SECTION 1. It is hereby recognized that destructive floods upon the rivers of the United States, upsetting orderly processes and causing loss of life and property, including the erosion of lands, and impairing and obstructing navigation, highways, railroads, and other channels of commerce between the States, constitute a menace to national welfare; that it is the sense of Congress that flood control on navigable waters or their tributaries is a proper activity of the Federal Government in cooperation with States, their political subdivisions, and localities thereof; that investigations and improvements of rivers and other waterways, including watersheds thereof, for flood-control purposes are in the interest of the general welfare; that the Federal Government should improve or participate in

“In the years following passage of this law,” wrote the Corps’ historians, “the Corps built . . . 300–400 reservoirs whose primary benefit was flood control. However, it is inconceivable that these reservoirs would have been built had flood control been the only benefit. In the age of multipurpose projects, possible navigation, water storage, irrigation, power, and recreation benefits are considered before a final economic benefit figure can be reached.”<sup>14</sup>

*In answer to cries for federal help to fight floods, drought, and the Great Depression, the 1936 Flood Control Act created a massive program that would ultimately give birth to the Tulsa District.*

**THE SOUTHWESTERN DIVISION.**

As the Corps began searching for the best flood control sites on the main tributaries of the Mississippi, a move was also afoot for a program for the same kind of control farther upstream.

Even the Engineers, said Kerr, “didn’t envision the irresistible forces they were setting in motion. Nor did they remotely contemplate that this new approach would not stop until it had been carried to the ultimate — the watershed program on the farthest network of its upper tributaries.”<sup>15</sup>

The 1936 Act authorized several levee projects and five reservoirs in the Arkansas River drainage basin: Great Salt Plains, John Martin (Caddoa), Fort Supply, Hulah, and Optima.

To oversee these projects, the Corps established on the first of July, 1937, the Southwestern Division office and the Little Rock District office. The Little Rock District was created from the shank of the Memphis District and included the territory that would soon become the Tulsa District. It included the Arkansas basin above Pine Bluff, the White River basin above Peach Orchard, Arkansas, and the Red above Fulton, Arkansas.

Previously the Memphis District had included the Arkansas and White basins; the Vicksburg District had contained the Red area. The Southwest territory was being carved into smaller Corps jurisdictions that would focus more intently on providing projects and public works.

The stage was being set for tremendous changes.

## **NEWT GRAHAM AND THE TULSA VISION.**

The father of the Tulsa District was Newton R. Graham, a newspaperman turned banker whose lifelong ambition was to open the Arkansas basin to the world's waterways.

"Newt Graham was the acknowledged leader for the comprehensive development of the Arkansas River," recalled Bob Kerr, "... in nearly a half-century of volunteer effort . . .

"Graham almost single-handedly won the new District (Corps) Office for Tulsa, in the interest of Arkansas navigation . . ."

Like other historians, Kerr described Graham with great affection and warmth. He recalled him as "a little dynamo" with a thatch of silver hair, a dimpled chin, and blue eyes that shone brightly behind rimless glasses who "ducked his head with characteristic modesty" when his accomplishments were pointed out.<sup>16</sup>

He had help, of course. This help came from a constellation of dealers in what Kerr called "white gold", and what they meant by white gold, of course, was water. They played the politics of water as deftly as they dealt in the politics of the region's famed black gold — oil.



### **NEWT GRAHAM: FATHER OF THE TULSA DISTRICT**

*When Larry Silvey, the editor of a 1979 historical book called *The Tulsa Spirit*, set out to describe the region's guiding lights over the years, he began, first up on page one, with Newt Graham:*

*"Newton R. Graham was a young man when on March 6, 1957, he died. To be sure, he was also elderly in years — 73 years, in fact; chronology does that to you. But Newt Graham was a Tulsan through and through, and as much as anybody he personified in a consistent manner the youthful exuberance of the *Tulsa Spirit*.*

*"N.R. Graham, the capitalist/banker, the businessman/volunteer, the seer of better things. Newt Graham helped stage a 50,000-person spontaneous celebration in Tulsa four days before World War I actually ended; the wire services said it*

*was over, and that was good enough for him.*

*"But more importantly, Newt Graham . . . was a person of dedicated vision: he saw, when few others could fantasize the reality, a waterway from Tulsa to the sea — a waterway that would create in Eastern Oklahoma a monument to government and free enterprise working together in a common direction toward human betterment.*

*"Newton R. Graham was young in spirit all his life because he cultivated his sense of idealism while embellishing his sense of realism. He artfully combined understanding, empathy, and persuasion to pursue a goal he would not live to see happen.*

*" . . . Thanks, Newt, for your help."<sup>17</sup>*



They were “the right men at the right time,” recalls *Tulsa Tribune* reporter Joe Howell, who has lived and reported on the story since 1934. They had “a good game plan, the flexibility to change it . . . , (and) an unlimited store of optimism and perseverance.”<sup>18</sup>

One launching point for their story was Muskogee, in 1905. Six members of the city’s Commerce Club, determined to prove that Arkansas River navigation was not only still possible but feasible, made a trip down the river to Fort Smith.<sup>19</sup> They not only proved their point, but they were led by the man who was to become Oklahoma’s first governor. These six civic leaders in 1906 contributed \$500 each to finance a steamboat, christened the *Mary D*, which carried in the subsequent 16 months 35,000 tons of freight to and from Fort Smith.<sup>20</sup>

***At Muskogee, dealers in “white gold” — the politics of water — launched modern-day Arkansas River navigation with the short-lived Mary D in 1906.***



(G. C. 3)  
**WAR DEPARTMENT**  
 OFFICE OF THE CHIEF OF ENGINEERS  
 WASHINGTON May 4, 1939.

General Orders)  
 No. 3 )

By authority of the Secretary of War, and effective July 1, 1939, a river and harbor district is established with headquarters at Tulsa, Oklahoma, under supervision of the Southwestern Division. The territorial limits of this district will include the watershed of the Arkansas River and the tributaries entering the same between Walnut Creek, Kansas, exclusive, and the Poteau River, Oklahoma and Arkansas, inclusive

Appropriate property, records and funds will be transferred from the Little Rock, Arkansas, District to the Tulsa District, as directed by the Division Engineer, Southwestern Division.

By order of the Chief of Engineers:

*Willis E. Teale*  
 Willis E. Teale,  
 Major, Corps of Engineers,  
 Chief, Personnel Section.

(G.O. 4)  
**WAR DEPARTMENT**  
 Office of the Chief of Engineers  
 Washington, May 17, 1939.

General Orders)  
 No. 4 )

General Orders No. 3, Office, Chief of Engineers, May 4, 1939, are amended to read as follows:

By authority of the Secretary of War and effective July 1, 1939, a river and harbor district is established with headquarters at Tulsa, Oklahoma, under supervision of the Southwestern Division. The territorial limits of this district will include the watershed of the Arkansas River and the tributaries entering the same between Walnut Creek, Kansas, exclusive, and the Poteau River, Oklahoma and Arkansas, inclusive, but exclusive of that portion of the watershed of the South Canadian River and the tributaries entering the same west of the Texas-New Mexico State line and now in the Conchas, New Mexico, District.

Appropriate property, records and funds will be transferred from the Little Rock, Arkansas, District to the Tulsa District, as directed by the Division Engineer, Southwestern Division.

By order of the Chief of Engineers:

Willis E. Teale,  
 Major, Corps of Engineers,  
 Chief, Personnel Section.



*Navigation optimists pressed forward with the City of Muskogee, but fledgling shipping schemes were no match for the railroads. It was not until 1939, when the Corps issued General Orders #3 and #4 creating the Tulsa District, that the odds began to shift toward success for water resource development in the Tulsa region.*

## **THE CITY OF MUSKOGEE.**

In 1908 another steamboat, the *City of Muskogee*, followed the same route. But the little boomlet in navigation was short-lived. It ran aground on a river clogged with sand and gravel that held no competition for dropping railway rates.<sup>21</sup>

Downstream, in the Little Rock and Pine Bluff areas, navigation promoters tried repeatedly to fan the fires of river travel. But little progress on water resources issues occurred in the region until the early 1920s. That was when Tulsa banker E. Fred Johnson persuaded Graham to devote his energies to promoting water resources.

Over the first 50 years of this century, numerous civic improvement associations either adopted or formed around the idea of water development. Most were centered along the Arkansas River and were named by some combination of the following: Arkansas, Basin, Improvement, River, Development, Association, or Committee. Many were affiliated with the Tulsa Commercial Club or its eventual successor, the Metropolitan Tulsa Chamber of Commerce.

Meanwhile, to the south, the Denison, Texas, Chamber of Commerce was pressing for construction of a "diversion dam" at Baer's Ferry, six miles northwest of Denison. It was to become the site of the future Denison Dam on the Red River, but not before a fight which extended over generations, from the Southwest to Washington and back again.

It took the 1936 Flood Control Act (which Kerr called the Magna Carta for the upstream tributaries of the Mississippi)<sup>22</sup> with its Oklahoma projects, to produce the long-sought Tulsa District office.

It was General Orders No. 3 and No. 4 that did it. The first was issued by the Chief of Engineers, by authority of the Secretary of War, on May 4, 1939. It established the Tulsa District, effective July 1, 1939. Then General Orders No. 4, on May 17, 1939, amended the original to clearly define the new District's boundaries.

Clearly, much had been done. A stage to play out the scenes of major redefinition of this land's character was set. The greatest work remained ahead.

## THE SYLLABLE WAR GOES ON

**M**ore than one heated debate has ignited through these times over the pronunciation of the Arkansas River.

It's generally pronounced "Ar-KAN-sas" in Kansas and "Ar-kan-SAW" in Arkansas. Oklahomans, for reasons probably unimportant and definitely forgotten, tend to side with the pronunciation of their eastern neighbors, the Arkansans.

But it can be a fightin' word, as reported by *The Topeka, Kansas, Daily Capital* on June 12, 1971:

"Last weekend when President Nixon and other notables were speaking at the dedication of the McClellan-Kerr Arkansas River Navigation system, they repeatedly referred to the river as the Ar-kan-SAW. None alluded to the fact that much of the water reaching the gates at Catoosa was actually Ar-KAN-sas River water picked up by the stream as it flowed through Kansas.

"Of course, it's the Ar-KAN-sas River. Ask anyone all the way from Coolidge to Arkansas City and they'll tell you that. Even in Holly, Colo., they call it the Ar-KAN-sas.

"Let's keep the pronunciation correct in all its purity at least from the river's source in the Rockies to where it crosses the Kansas-Oklahoma line.

"The Arkansas River, sometimes referred to as 'the Nile of America,' was first sighted by the Spanish in 1541. They called it 'the River of Quivera.' Marquette, the great French explorer, called it the Akansa. To the Mexicans it was Acansa.

On a map printed in 1750 it was the Rio des Acansas. And on a map in 1757 it was spelled as it is spelled now, Arkansas.

"A Frenchman, Perrin Du Lac, who traveled through the Louisiana country in 1801, spelled it 'Arkansas.' In 1853, two of the large boats which plied the lower reaches of the river were the 'Arkansas' and the 'Arkansaw,' indicating that at that time there were two pronunciations of the name.

"Controversy for years swirled about the pronunciation of Arkansas, the state. Early settlers pronounced it Ar-kan-SAW, after the Indians for whom it was named. Other pronounced it phonetically as it is spelled, Ar-KAN-sas.

"Finally, in 1881, the general assembly of the state adopted a resolution, stating the pronunciation as that received by the French from the Indians, to be officially Ark-kan-SAW. It was to be pronounced in 3 syllables with the final "s" silent and the "a" in the first and last syllables with an Italian sound.

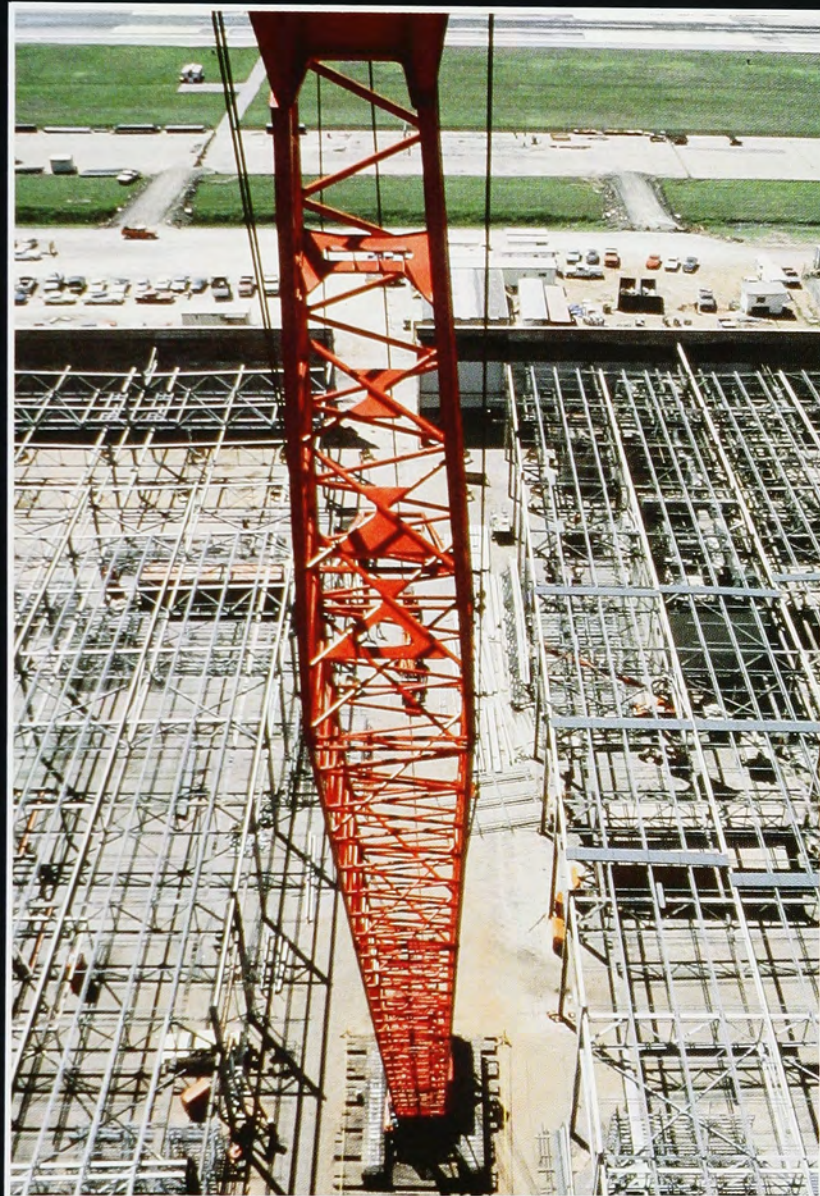
"The sounding of the final 's' was to be discouraged. Today, it would be little less than high treason for an Arkansawyer to pronounce it any other way.

"However, this has nothing to do with the pronunciation of the Arkansas River. It has never been legislated, as far as we know.

"So let them dredge the Arkansas River, widen it, dam it, or pave it, but call it the Ar-kan-SAW — never!"<sup>23</sup>

# **SECTION 3: WORLD WAR II AND BEYOND**

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# We the People

of the United States, in order to form a more perfect Union, establish Justice, insure domestic Tranquillity, provide for the common Defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

Article I

Article II



# This We'll Defend

done in Convention by the unanimous Consent of the States present the Thirteenth Day of September in the Year of our Lord one thousand seven hundred and eighty seven and of the Independence of the United States of America the Twelfth In witness whereof We have hereunto subscribed our Names

The words 'We the People' being understood between the second and eighth lines of the first page, the words 'This' being partly written on an oblique in the fifth line of the first page, the words 'done' being understood between the third and fourth lines of the first page and the words 'the' being understood between the first and second lines of the second page.



## Chapter 1

# THE CLOUDS OF WAR

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*"In the past few years — and, most violently, in the past few days — we have learned a terrible lesson. We must begin the great task that is before us by abandoning once and for all the illusion that we can ever again isolate ourselves from the rest of humanity. We are going to win the war, and we are going to win the peace that follows."*

— Franklin D. Roosevelt, Dec. 9, 1941

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Even as

### **THE TULSA DISTRICT**

was being formed, the clouds of war were gathering on the world's horizon. But isolationist America clung to a fond hope of peace in the face of a world plunging headlong toward conflict.

Although the District was created for the peaceful use of water resources, the earliest history of its territory, after all, was written by military missionaries:

- Coronado, undoubtedly the first visiting soldier to view the district territory in 1541;
- French explorers and American surveyors who charted the region's rivers in the early 1800s;
- Fort Gibson soldiers, who opened the historic Three Forks region to settlement in 1824;
- Military roadway builders who linked Fort Smith and Fort Gibson overland in 1826.

Yet the District was born in an era when a weary United States was more concerned with 1930s' domestic problems. Many Americans were determined to resist what history now recalls as an inexorable march by much of the civilized world toward war.

Threatening

### **THE FOUNDATIONS OF CIVILIZATION.**

In July 1937, the Southwestern Division was being created and was gearing up in the region to implement the 1936 Flood Control Act. Meanwhile,

- Japan was invading China.
- Hitler was preparing to invade Austria.
- Neville Chamberlain was leading Britain and the west in a program to make Hitler reasonable through appeasement.
- In the United States, isolationists were objecting to President Roosevelt's warning that "the present reign of terror and international lawlessness" had reached a stage "where the very foundations of civilization are seriously threatened."

Fall, 1938. American attitudes reached a turning point. The Munich Agreement exposed the full cost of appeasement: a Germany hegemony in Central Europe and incentives for further, worldwide intimidation and aggression.

Spring, 1939. While the Corps was writing General Orders No. 3 to establish the Tulsa District, Hitler was invading Czechoslovakia. A new, aggressive government was coming to power in Japan that would soon link with Germany and Italy in a Tripartite Axis Pact, keen on seizing and dominating existing territories throughout the world.

Nov. 18, 1940. The Tulsa District was gearing up for civil works construction, even as national shifts of responsibility took place. Historically, the Quartermaster Corps led in noncombatant construction. Now, Air Corps construction work was transferred to the Army Corps of Engineers.

One year later, on Dec. 1, 1941, President Roosevelt was ordering all Army construction work centralized with the Corps. This put the Tulsa and Denison Districts, as well as others nationwide, directly into the military construction business.

Less than a week later, following the Dec. 7 attack by the Japanese on Pearl Harbor, the United States was at war.

For those

## **GENERATIONS OF US REARED IN PEACE,**

and in an era when it's chic to be cynical about military endeavors, it's hard to conceive the single-minded dedication and patriotism that swept the United States in the wake of Pearl Harbor.

Winning the war — and, most Americans were convinced, saving the world for freedom — required a sudden shift from peacetime to military pursuits both abroad and at home.

Fortunately, both the Tulsa and Denison Districts were already mobilizing for unprecedented work in this period. Most, though not all, peacetime projects were deferred for the duration of the war. The Corps' capability was shifted almost overnight into military construction of the highest urgency.

The region was a prime site for airfields, flying schools, bombing ranges, and aircraft production because of, in part, the area's generous stretches of level terrain and excellent flying weather. (Oklahoma City, for example, averages 328 flying days a year.)

The large, sparsely populated area, with terrain similar to lands where fighting was occurring, was also well suited for training camps.

The first orders were for construction of facilities for aircraft production and maintenance, airfields, training camps, and munitions plants. The devastating attack on Pearl Harbor had spelled out the immediate importance of air power in the government's conduct of the war and gave a special urgency to the work.

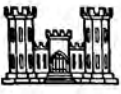
The scope, pace, and intensity of the Corps' wartime work almost defy imagination. In some instances, orders to begin construction included directions to effect "immediate" completion. Actual aircraft assembly could not wait for hangars to be completed; assembly often began before the walls of the buildings went up.

At the height of the World War II construction blitz, the Tulsa District completed a new building every 20 minutes, 24 hours a day, seven days a week.<sup>1</sup>

Before the war ended in 1945, the Southwestern Division had handled about \$2 billion in military construction work, roughly one-fifth of the U.S. mobilization projects.<sup>2</sup>

A significant share of the important projects were delivered from the Tulsa and Denison Districts, which completed \$800 million in construction and procured \$100 million in special engineering equipment and supplies. This major part of the stateside work proved essential in winning the war.<sup>3</sup>

It was this work that spelled the difference. Said one military leader, reflecting on the American victory, "Mobilization was decisive and construction generally controlled mobilization."<sup>4</sup>



## Chapter 2 WORLD WAR II

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*“The hand that held the dagger has struck it into the back of its neighbor.”*

— President Roosevelt, Spring 1940

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In the

### **SPRING**

**OF 1940**, Hitler was preparing a blow he hoped would break the will of his western enemies: the blitzkrieg attacks that in rapid succession conquered Denmark, Norway, Holland, Belgium, and France. More than 350,000 British and French troops had to be rescued at Dunkirk by a flotilla of small boats.

Now Britain stood alone against an axis of expanding German and Italian power that would soon include Japan. The new British Prime Minister, Winston Churchill, stirred the imaginations of Americans when he promised his people nothing but “blood, toil, tears, and sweat,” with a pledge to “wage war by sea, land, and air, with all our might and with all the strength that God can give us.”

Responding to what Americans now perceived as an imminent threat, Congress instituted the first peacetime draft and voted additional funds to increase the size and striking power of military forces, including the construction of 30 new warplane plants.<sup>1</sup> Roosevelt asked Congress for a billion dollars in new defense allocations and called for the production of 50,000 warplanes a year.

The call

### **FOR THE LIBERATORS**

came just as the fledgling Tulsa District entered the fray. As early as November 1940, orders had been received to build several small airfields for the Civil Aeronautics Administration.

But in early 1941 the District got its first major military assignment: to build the \$27 million Tulsa Aircraft Assembly Plant Number Three. This facility, which now hums under the flag of McDonnell Douglas, was called the Tulsa Bomber Plant. On any scale, this was a major project. Its main building was 320 feet wide and nearly a mile long, and the airfield covered 750 acres. The plant, on land provided by the City of Tulsa, adjoined the Tulsa Municipal Airport.



*With dazzling speed, the Denison and Tulsa Districts built facilities needed to mobilize a nation at war. A prime example: the Tulsa Bomber Plant, 1942.*

**We are the only nation in the world that waits till we get into a war before we start getting ready for it.**

— Will Rogers

The mandated schedule was, by any standard, urgent. Notified about the project on Jan. 4, 1941, the Corps began construction May 2, 1941, and completed the job Sept. 30, 1942.

Meanwhile, the nation at war could not wait for the building to be completed. The plant produced its first heavy bomber on Aug. 15, 1942 — 45 days before the building was complete.

Before military construction was phased out in 1945, the plant had employed as many as 23,000 people and had produced 952 of the famed B-24 heavy bombers. “The Liberators,” as the B-24s were called, were among the most essential tools used to win World War II. Every 19.5 hours during peak manufacturing, the production line yielded another B-24, each 66 feet long with a 110-foot wing span, ready to carry a 10- to 12-man crew to battle zones. The plant also built or modified nearly 6,000 other planes, including the Army A-24 dive bomber, A-20 Havoc, and the B-17 Flying Fortress.<sup>2</sup>



***The war couldn't wait for dedication of bomber plants at Tulsa, above, and Oklahoma City, below. While the buildings were still under construction, both began cranking out B-24 and C-47 airplanes, at a rate faster than a plane per plant per day.***



Photo courtesy Tinker AFB Department of History

Oklahoma City

## **LANDED TINKER AIR BASE**

in similar fashion. As in Tulsa, leaders there pulled together to purchase and prepare land as an inducement to build military facilities in the area.

Exactly one month after it was authorized for an initial cost of \$29 million, construction began on Tinker Air Force Base at Midwest City. This massive air depot, one of the largest and most modern in the United States, was named for Maj. Gen. Clarence L. Tinker, a native Oklahoman and part Osage Indian who was killed in 1942, while leading his bomber command on a strike against the Japanese at Wake Island.

With similar speed, the \$42 million Oklahoma Aircraft Assembly Plant Number Five in Oklahoma City was built in 12 months after construction was authorized on Mar. 24, 1942. The mission of the plant's 24,000 workers was to fabricate and assemble 208 C-47 cargo-transport planes every month. Nine months after construction began, the construction company turned over the first work area to Douglas, the operating company. The first C-47 rolled off the assembly line here, too, before the building was finished.<sup>3</sup>

Military projects were assigned on the basis of capability rather than on strictly geographic lines. Thus, both Tulsa and Denison Districts were responsible for construction work throughout a broad region that sometimes included the Fort Worth area, Arkansas, and Louisiana, as well as the Arkansas and Red River basins in Kansas, Oklahoma, and Texas.



***The fight to win World War II was grounded in the mud, sweat, and tears of work such as this: construction of Tinker Air Force Base in Oklahoma City, 1942.***



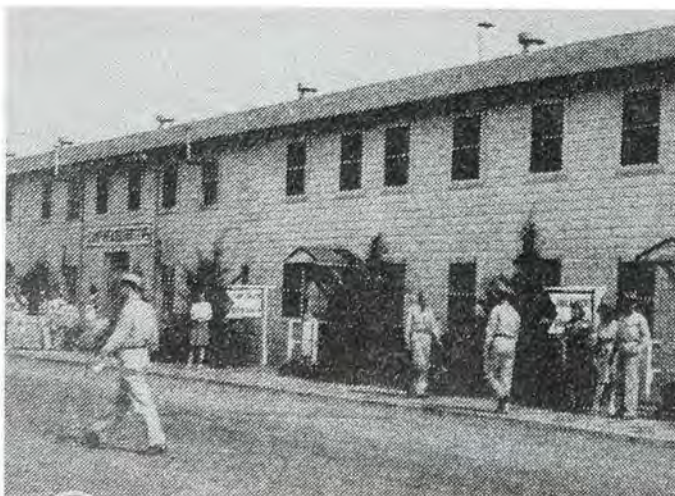
Photos courtesy Tinker AFB Department of History

Among other wartime military construction projects completed by the Tulsa and Denison Districts were

- Camp Gruber, built on 25,000 acres of land southeast of Muskogee, included 2,200 buildings and cost more than \$36 million. Peak training: 45,000 to 50,000 men at a time.
- The \$60 million Oklahoma Ordnance Works, between Chouteau and Pryor was the largest single military construction project undertaken in the Tulsa District, at least in terms of cost. The project was built over a two-year period, to manufacture such military explosives as smokeless powder and TNT.
- Five flying schools in Kansas.
- Will Rogers Field in Oklahoma City and municipal airports at Enid, Tulsa, and Joplin.
- Flying schools in Dalhart and Pampa, Texas; and in Enid and Perry, Oklahoma.
- Bombing ranges, hospitals, air fields, and prisoner-of-war camps.



***The Tulsa District built factories that manufactured soldiers, such as Camp Gruber southeast of Muskogee. During the war's peak, on any given day as many as 50,000 were being trained there.***



Photos courtesy Camp Gruber History Department

## NO SAFETY NEGLIGENCE ALLOWED

**O**f those who died as participants in World War II, all were not lost on foreign soil. A number of them died stateside, and some of those ill-fated war workers were with the Tulsa District Corps of Engineers.

"Death went on a spree during the month of June in the Tulsa Engineer District," the Tulsa Oiler reported in July 1942. "Five fatal accidents occurred and brought with them the grief and suffering that accompanies unnecessary loss of life."

The District was shocked by the deaths, which stood in sharp contrast to the District's overall distinguished safety record. The Tulsa District newsletter detailed the losses:

- Electrician Charles Richey electrocuted June 3, 1942, at the Aircraft Assembly Plant when he came in contact with a 220-volt circuit while operating a 40-foot electrically powered door.
- Laborer John Franklin Harris killed June 8, 1942, at the Oklahoma City Air Depot construction site, in the collapse of a 6-foot ditch undercut by rain.
- Laborer O.W. Beck killed June 9, 1942, while unloading sand for a contractor at the Enid Army Flying School.
- Employee William Coulson killed June 20, 1942, at Ada Municipal Airport No. 1 when a holding pin sheared off and let a front wheel drop on him while he was greasing a pneumatic roller.

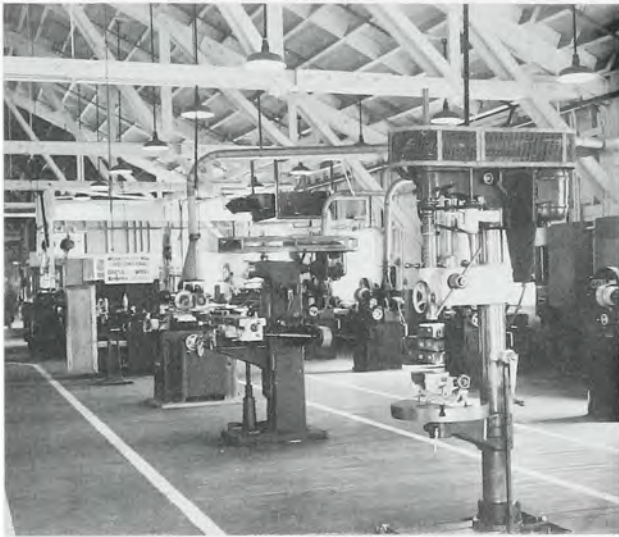
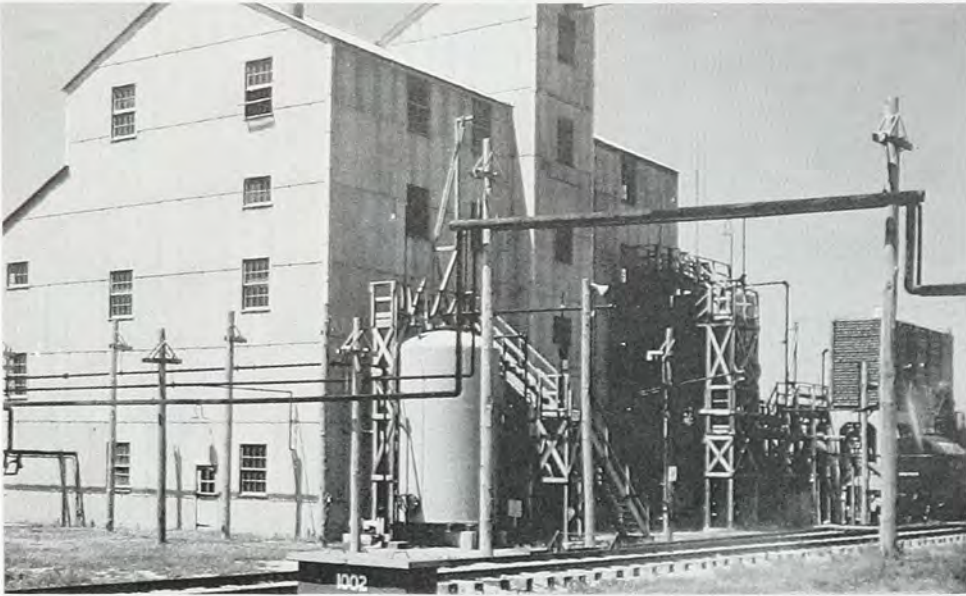


**Col. Montgomery**

- Truck driver Truman E. Sherrer killed June 26, 1942, in a one-vehicle accident at Fort Gibson Dam construction site. He slipped while putting oil in a truck crankcase and sat down on a 12-inch upright metal rod welded to the bumper for a flag staff, causing fatal internal injuries.

District Engineer H.A. Montgomery issued a stern warning that safety had to be improved at some projects or the District could lose its lead in safety records in the Southwestern Division.

Montgomery ordered inspectors for both contractors and the government to be prepared, in the event of an accident, "to prove the accident was in no way due to lack of attention or negligence on his/their part. Disciplinary action will be recommended for those who do not cooperate fully . . . ." <sup>4</sup>



*In the business of war, explosives were a critical commodity. The largest building project completed by the Tulsa District during World War II was the \$60 million Oklahoma Ordnance Works, built in 1942 between Chouteau and Pryor, to manufacture military explosives such as TNT. In 1946, the OOW was declared surplus. The asking price was determined by Meryl Lindsey, Bill Stone, and Lee Hogue.*

**O, what men dare do!  
 what men daily do,  
 not knowing what they do!  
 — Shakespeare**



## WAR AND SPEED

**H**ow fast did construction go during World War II?

The following story illustrates the answer for the Corps' Southwestern Division:

"The construction of two bomber modifications plants at Tulsa and Oklahoma City showed the speed at which the Southwestern Division and its districts worked.

"The Office, Chief of Engineers, ordered two large 'hangar-like, fireproof structures of concrete and steel' and wanted them immediately. The price tag for each was \$4 million. Within 24 hours of receipt of the orders, the Tulsa District Engineer, Col. Francis J. Wilson, had signed contracts with two architectural/engineering firms. The

companies moved with amazing speed. Major General Thomas M. Robins, assistant chief of engineers, described the construction:

"Progress on both jobs proceeded at about the same rate, neither job getting more than a few days ahead of the other. . . The methods of attack used by the two contractors on the erection of the buildings, however, were quite different. [One] chose to erect freestanding concrete columns and to start the roof steel almost immediately, while the [other] chose to erect the concrete center portion first, letting the roof steel wait until that part of the work was complete."

Construction of the two plants, normally expected to take one year, was finished in three months.<sup>5</sup>

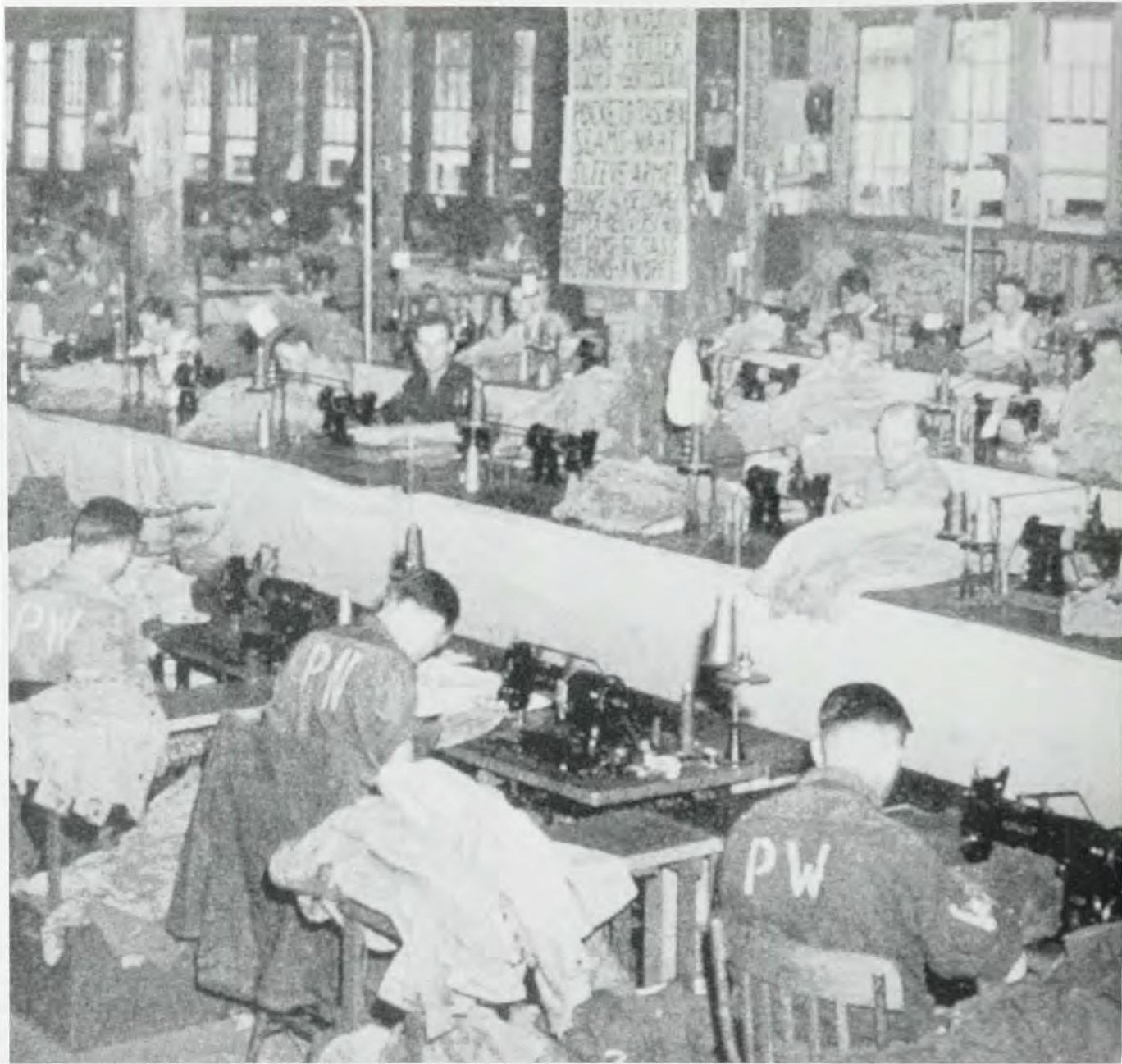


**Col. Wilson, seated, and his key staff, led much of the Tulsa District World War II work, 1942-1946. Below, the District built airfields such as Enid Army Air Field, 1944.**



Photo courtesy Vance AFB, OK

**They erected instant cities. Working at dizzying speed with a civilian army of engineers, technicians, contractors, and suppliers, the District built schools, hospitals, cantonments, prisoner-of-war camps, airfields. Work by the Tulsa and Denison Districts was critical to the war because of the region's level terrain and good flying climate.**



“We’re digging

**HITLER’S  
GRAVE TODAY,”**

said Maj. Gen. G.C. Brant in April 1941 at a bomber assembly plant groundbreaking in Fort Worth. Completed 100 days ahead of schedule, the Texas plant had put B24 Liberators in the air by November 1942.

Denison was moving even faster than Tulsa in construction, in terms of dollars. By mid-1943, Tulsa had completed about \$312 million in construction; Denison, on the other hand, was nearly finished with \$380 million in construction. That included, in addition to the Fort Worth plant

- Sheppard Field at Wichita Falls, Texas, completed in 105 days despite 100-degree weather and rains that made a quagmire of the site. Six months after completion, it was handling its capacity of 26,000 aviation mechanic trainees.
- Three huge cantonments built outright: Camp Fannin at Tyler, Camp Howze at Gainesville, and Camp Maxey at Paris. Expansion at Fort Sill amounted to building virtually a new cantonment.
- Flying schools, hospitals, training bases, expansion of Love Field in Dallas, and prisoner-of-war camps.



*Dining hall, Sheppard Air Force Base*

A period of

**REMARKABLE  
EXPANSION**

came to the Corps of Engineers in World War II. At Tulsa and Denison, the war emergency forced rapid assembly of crack teams of thousands of engineers, technical and support personnel, contractors, and suppliers.

Engineers and workers with diverse skills had to be recruited and absorbed into the Engineers' organizational structure, eliminated if they did not fit, and most of them gradually released from employment as their tasks were completed.

One method of retaining key personnel was commissioning them as officers in the Army, even if they had no previous military experience. On Sept. 30, 1942, there were 51 Army officers on the Tulsa District staff, including many who would be among the most able civilian leaders in the District during subsequent decades.

The still-infant Tulsa District had grown to 499 workers by the last day of 1940. Three months later the number was 602. On June 30, 1941, the total had reached 800. The peak reported employment was 2,691 on June 30, 1942. By Dec. 31, 1943, the figure was down to 1,518; by Mar. 31, 1945, down to 831, the day before the two districts merged. Denison District employment peaked at 5,200 in July 1942, then dropped to about 875 a few days before the merger.

## THE DIFFICULT QUICKLY DONE IN DENISON

**A** small stateside army named the Denison District, U.S. Army Corps of Engineers, performed a series of miracles in the early years of World War II — setting the record by producing more work in less time than any of the other 40 Corps districts.

A year and a half into the global war, the District had accomplished “miracle after miracle” to build 56 different projects, ranging from auxiliary airfields to one of the nation’s largest bomber plants, the Denison Herald reported on June 15, 1943.

The list included five ordnance plants, two aircraft assembly factories, seven flying schools, ten other airports, sixteen auxiliary fields, seven prison camps, two aviation mechanic schools, three big hospitals, and four great cantonments, each a large city in itself, accommodating many thousands of men.

And what is more, the Herald reported, “most of this work has been finished ahead of schedule — speed being the last that has driven the engineers steadily forward to achieve undertakings that might have frightened them into surrender had they time to contemplate what was going on and to know how much more was coming.”

What the Herald called a construction blitz of a maze of projects was completed

by “a veritable army of between 50,000 and 60,000 workers . . . including contractor employees and as few as 50 or as many as 3,720 Denison military employees.” (This number does not include civil works employees.)

The Denison District opened its doors with 285 civil employees on Jan 1, 1939; civil employment jumped to a high of 1,700 in the summer of 1942, mostly for work on Denison Dam, then dropped off to 823 by the summer of 1944.

Meanwhile, military work began with 50 employees in early 1941, rose to a high of 3,720 in the summer of 1942, then dropped to 770 by the summer of 1944.

The Herald called the District work “a veritable melting pot in which men and women from all corners of the nation and from all walks of life have intermingled in one common undertaking.” The military projects division was headed first by Major E.J. Wanless and Wanless’s first assistant, Asa Shannon, then by Lt. Col. Quinton C. Harvey.

“Under pressure of the emergency of global war,” the Herald wrote, “the military projects division of the Denison District U.S. Army Corps of Engineers has fulfilled the tradition of the Army Engineers — by doing the difficult quickly and by taking a little longer for the impossible.”<sup>6</sup>

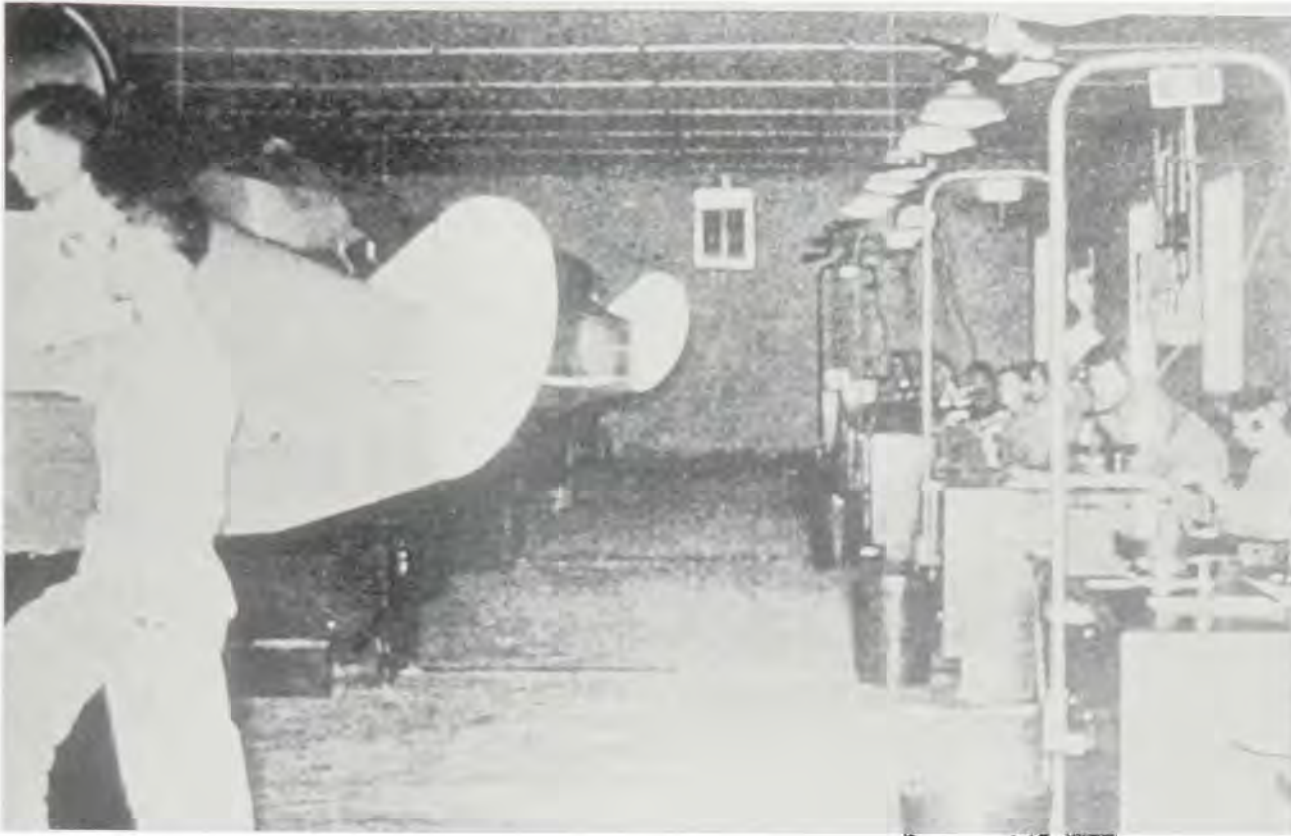
Pressure on the staff increased as work schedules accelerated. Quality personnel were hard to find and employment conditions were far from orthodox. In some cases, wartime commissions brought reversals in authority. Some junior engineers in civilian life, when activated in the reserves, returned with a commission to outrank their senior engineer.

At the height of employment activity, both districts employed more than 7,500 Corps personnel. And this was a fraction of the full team involved in the District’s total public/private effort. Others on the team included engineers, architects, construction contractors and subcontractors, and thousands of other employees and workers who, as Settle reported, joined “to work the near miracle without which the war could not have been won.”<sup>7</sup>

Fighting the

### **CALENDAR**

**AND THE CLOCK,** Tulsa District workers found that time was as much the enemy as the enemy “over there.” To beat the clock, employees developed new and unconventional methods of



**1942: The U.S. and British landed in North Africa, the Marines in Guadalcanal — and on the home front, mobilization was everybody's number one mission. Left photo: flight simulators, Altus Air Force Base. Below: left, Lubbock Army Flying School (now Reese Air Force Base); right, construction at Tinker Air Force Base. Tulsa District employees such as Capt. James Lee Hogue, Jr. (top right photo), Appraisal Branch chief, reported for duty in uniform.**

Photo courtesy Reese AFB History Office



Photo courtesy Tinker AFB Department of History



bookkeeping, accounting, and procurement. Major construction contracts such as Tinker and the Oklahoma City bomber plant were awarded on a “cost-plus fixed-fee” basis, allowing the contractor to begin construction while negotiations continued.<sup>8</sup>

Maj. Jerra Wilcox and then Capt. James Lee Hogue, Jr., headed a real estate operation organized in August 1942. In their view, delay in acquiring land for a war project was not acceptable. They were aided by the Second War Powers Act, which authorized blanket condemnation action to obtain immediate possession. Where the appraisal price was acceptable to an owner, he could complete the sale and have his tract withdrawn from the condemnation procedure. Many counties and cities, seizing the opportunity for a perhaps-permanent boost to their economies, donated land to the government for installations.

In some cases, priority procurement requests were overridden, without explanation, by requests from the Manhattan Engineer District in Los Alamos, New Mexico. The mission of the super-secret special Manhattan Corps District — named after the Corps office in New York — is now well known, having been especially created in August 1942 as part of the project to build the atomic bomb. But it wasn't until that first A-bomb was dropped on Hiroshima, Japan, in August 1945 that the Southwestern Division learned why its priorities had been overridden.<sup>9</sup>



## Chapter 3 A POSTWAR WORLD

*"If you are scared to go to the brink, you are lost."*

— John Foster Dulles

Demobilization

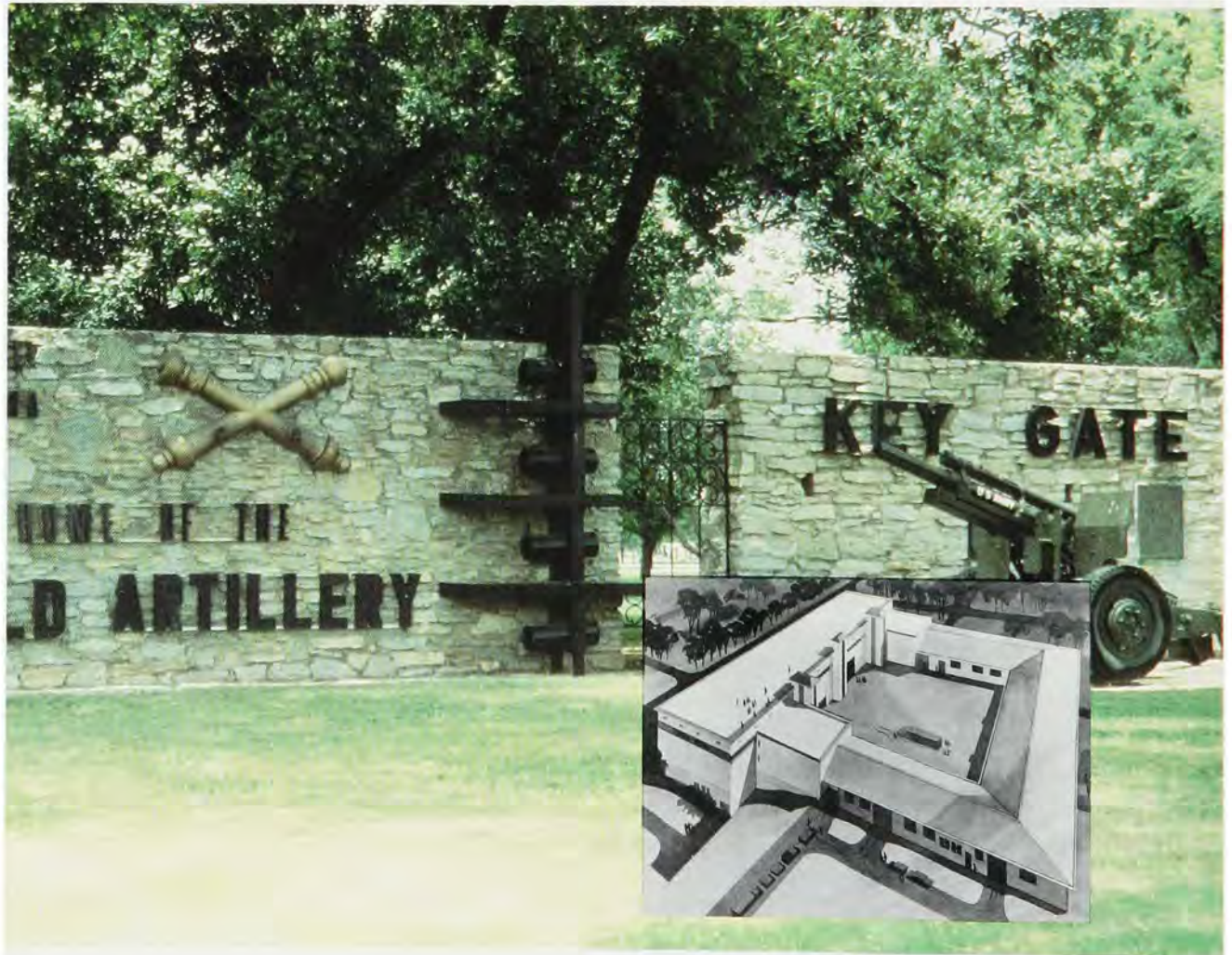
### **IN POSTWAR AMERICA**

was a challenge. Preparing for war had been a difficult and arduous task, but once over, it took the Tulsa District two years to scale back from its World War II stance.

Projects that would be useful in a postwar era were completed, but much of the construction work in progress, now no longer needed, was canceled.

In 1945 the Denison District was abolished and made a suboffice of the Tulsa District. This threw Arkansas and the northern two-thirds of Louisiana into the Tulsa District for purposes of military construction.

Tulsa, in fact, continued to bear responsibilities for construction and some maintenance at military bases, POW camps, arsenals, and military installations until 1961, when Corps' reorganization and Tulsa's heavy civil workload prompted a shift of military work elsewhere. Between 1941 and 1961, the Tulsa District carried a significant military workload, building all or parts of about three dozen military installations in Oklahoma, Kansas, and Texas. A good deal of that construction would have to do with another American conflict, this one in Korea.<sup>1</sup>



**Fort Sill entrance and (inset, architect's rendering) Artillery and Missile Command**

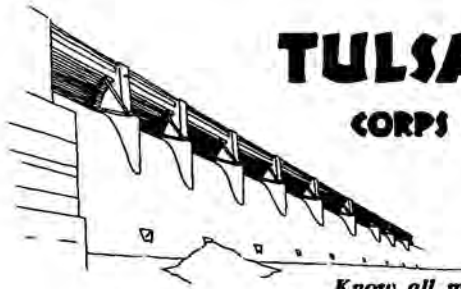
**The real dilemma we face is whether a free society in which each of us follows our own self-interest can compete over a long period of time with a totalitarian society....**

— John F. Kennedy, 1959

# TULSA DISTRICT

CORPS OF ENGINEERS

1941  
1947  
1948  
1949



Know all men by these presents, that:

**Claude H. Chorpensing**

O-12088, Colonel, CE, District Engineer, Tulsa District, Corps of Engineers

Has met all of the requirements necessary to be classed as a qualified Engineer, a swell boss and an all-around good fellow.

The sound judgment, unbiased fairness, and wonderful treatment he has shown all employees of the Tulsa District, in the field and in the office, has given him a place of high esteem and respect among us.

In testimony thereof, we the undersigned express our appreciation for the pleasant association of working with him during his tenure as District Engineer of the Tulsa District, and we extend to him best wishes for success and happiness in his future assignments.

*[A large block of handwritten signatures and names, representing the staff of the Tulsa District, expressing their appreciation for Colonel Chorpensing.]*



Col. Claude H. Chorpensing was District Engineer in the difficult post-war years, 1946-1949. The well-respected Chorpensing, later to become Assistant Chief of Engineers in Washington, garnered signatures of hundreds of his staff along with their good wishes and farewells.



The fires

## **OF WORLD WAR II FADED**

into the coldness of a postwar world. The United States was preoccupied with rebuilding a peacetime economy. In fact, the guns-versus-butter ratio going into 1950 at the Tulsa District was a typical 1:17. That meant that \$1 million was being spent on military construction compared to every \$17 million for civil works.<sup>2</sup>

One project, construction of the Veterans Administration Hospital at Bonham, Texas, was well underway when, on June 25, 1950, North Korean troops crossed the 28th parallel in a surprise invasion of South Korea. President Truman lost no time in committing U.S. troops to the defense of South Korea.

The U.S., however, was not prepared to wage a conventional war in Korea, and the sudden onset of the conflict there produced stark changes in the Corps. The military workload in the Tulsa District once again climbed in response to the nation's buildup for still another war.

By the time of the outbreak, most of the District military installations had been deactivated or disposed of. Two major facilities remained: Fort Sill, an artillery school in southwestern Oklahoma, and Tinker Field, the huge Midwest City Air Force materiel and maintenance depot and the largest industrial employer in Oklahoma since World War II.

When the renewed military action forced reactivation, Tulsa workers first were required to make expansions and improvements at Fort Sill and Tinker. In addition, the District reactivated Altus, Amarillo, Ardmore, and Vance Air Force Bases; Camp Gruber; Sheppard and Perrin Fields; and Lone Star, Longhorn, Red River, and Pantex Arsenals. It also built aircraft warning and control stations in eastern and central Oklahoma.

Constructing a military base is like building a specialized city. Thus, the construction work included living quarters, medical facilities, chapels, roads, warehouses — and airport runways, taxiways, aprons, and underground shelters.

By 1950 the District's military work had dropped to about \$1 million a year; by 1954 it had climbed back to more than \$20 million. Between 1950 and 1954, the District awarded construction contracts for almost \$150 million — about \$100 million of that military and \$50 million in civil works. Between 1950 and 1959, the Tulsa District had been responsible for \$235 million in construction.<sup>3</sup>



***The business of barracks, buildings, paving, pouring continued in the post-war world of the Tulsa District.***



Photo courtesy Vance AFB



**Far left: The District landscape includes Vance Air Force Base. Left: Col. Howard W. Penney served as District Engineer between 1959 and 1962.**

From the **BRINK TO THE SKIES** was the call of the “homogenized” 1950s:

- Eisenhower was in the White House.
- Earl Warren led on the Supreme Court.
- Joe McCarthy was in the Senate.
- Khrushchev was at Camp David.
- And, by 1959, Castro was in power in Cuba.

Truman’s hope for Communist containment gave way to Dulles’ brinkmanship, the new-look, get-tough foreign policy that depended on the atom bomb and defense through “massive retaliation” capability.

In Tulsa, Col. Howard W. Penney took that to heart and installed a fallout shelter in his back yard. But with nuclear proliferation, the nation’s theories of defense moved from underground to the skies.

The Corps and the Tulsa District moved into an era of guided missiles, when the Department of Defense in 1957 began erecting surface-to-air missile sites around major metropolitan areas.<sup>4</sup>

And by the winter of 1961, Khrushchev had delivered his saber- rattling speech that prompted John F. Kennedy to declare in his inaugural address:

“Let every nation know, whether it wishes us well or ill, that we shall pay any price, bear any burden, meet any hardship, support any friend, oppose any foe, in order to assure the survival and success of liberty.”

The U.S. must move quickly, Kennedy asserted, to close the “missile gap.”

The Corps was launched on an accelerated military construction program to support the massive missile buildup of 1961. The plan called for erecting rocket-launching facilities to intercept and retaliate against a nuclear attack on the United States. For the Tulsa District military mission, the complex ICBM (inter-continental ballistic missile) signaled the beginning of an end of military work.

Defense plans called for building 75 missile-launching sites in the U.S. This included a \$47 million facility surrounding Altus Air Force Base, built by the Tulsa District and capable of launching the Atlas ICBM.<sup>5</sup>

The Atlas had a range of 9,000 miles at 16,000 miles an hour and was capable of delivering an atomic warhead. To supply, maintain, and fire the weapon, elaborate ground facilities needed to be built. Each underground storage/launching silo would be 174 feet deep and 52 feet in diameter. Walls would be concrete 12 feet thick; doors, 2.5-foot-thick steel. Each would include an underground bunker housing a crew of five plus fuel, communications, and other support systems.<sup>6</sup>

The procedure,

### **COL. PENNEY'S**

**RED BALL SYSTEM,** kept the Atlas ICBM project at Altus moving ahead on schedule. The rush basis of the project prompted Settle to call it “the most challenging military construction project ever given to the Tulsa District.”<sup>7</sup>

The mission was immense: 12 silos were to be built underground, each 19 to 40 miles from Altus Air Force Base, and all interconnected with the project’s masterminding communication and control system. The \$20.9 million contract called for completion in one year.<sup>8</sup>

The Tulsa District responded in April 1960 by letting its largest construction contract to that date. Sharing the joint venture in constructing the Atlas silos were Morrison-Knudson and Hardeman & Associates Companies.

The Chief of Engineers was reviewing construction progress daily,<sup>9</sup> and the schedule called for issuing the first construction contract before the ICBM design was complete. This led to what Col. Penney called a problem of “concurrency.” As the design changed, plans were constantly revised, costs constantly re-estimated, and contracts constantly renegotiated. The colonel devised a “red ball system” of expediting paperwork, so that every piece of paper that related to the Atlas project was stamped with a red ball, always hand-carried, and always placed on the top of work stacks.<sup>10</sup>

But the red ball system, effective as it was, would not prevail. Although the Tulsa work was on schedule, other contracts were behind. Missile construction responsibility was transferred — six months into the Altus job — to a special Los Angeles district in a move to get the entire country’s missile base construction on schedule.

Missile silo construction experience prompted the Corps in 1961 to realign military responsibilities and boundaries, restricting military construction to 17 districts.<sup>11</sup> About 160 Tulsa employees were transferred with the work.

For the coming two decades, this ended major military construction work in the Tulsa District. But it also marked the beginning of a new era in civil works. Maj. Gen. Robert J. Fleming, Jr., Southwestern Division Engineer, discussed the realignment in a March 30, 1961, letter to Senator Bob Kerr:

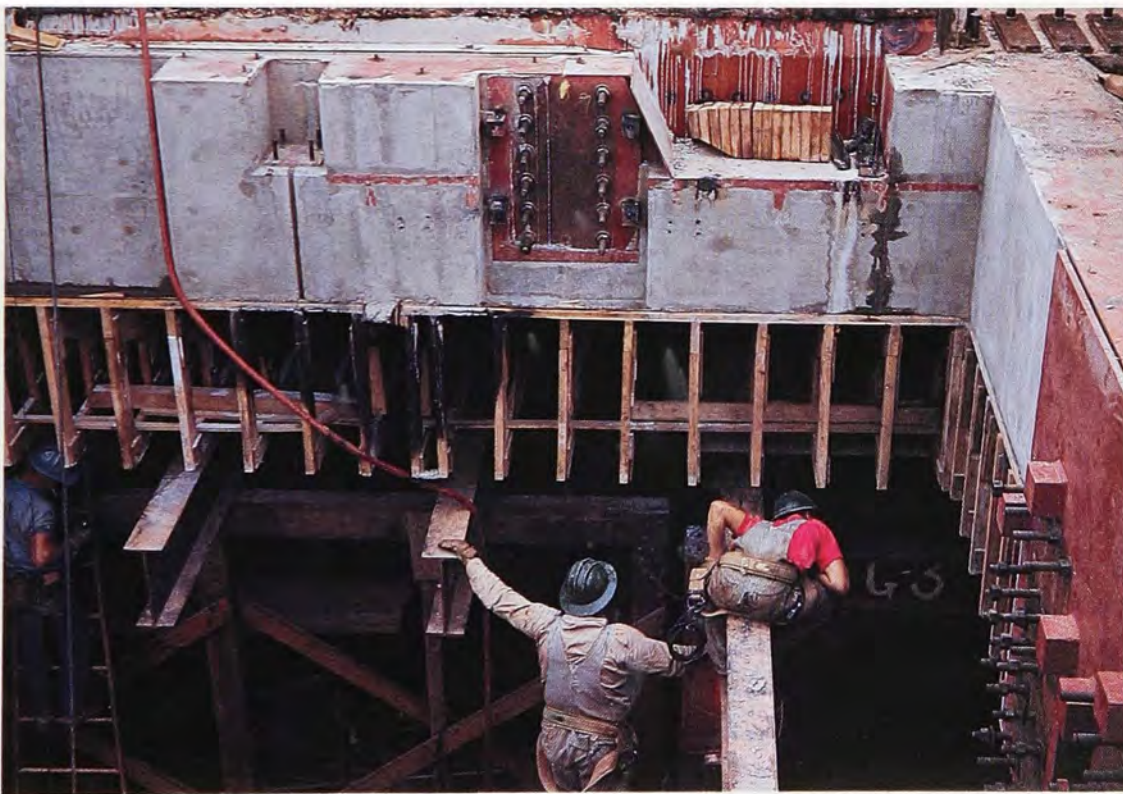
“The expanding civil works program in the Southwestern Division will to a considerable extent compensate for the decline in the military construction program,” Fleming wrote. “This is certainly the case in the Tulsa District where the civil works programs for the next few years will be of an unprecedented magnitude.”<sup>12</sup>

*The gentlemen of the Corps, at the close of the 1950s decade, included seasoned officers who conducted the complex military work of the Tulsa District.*

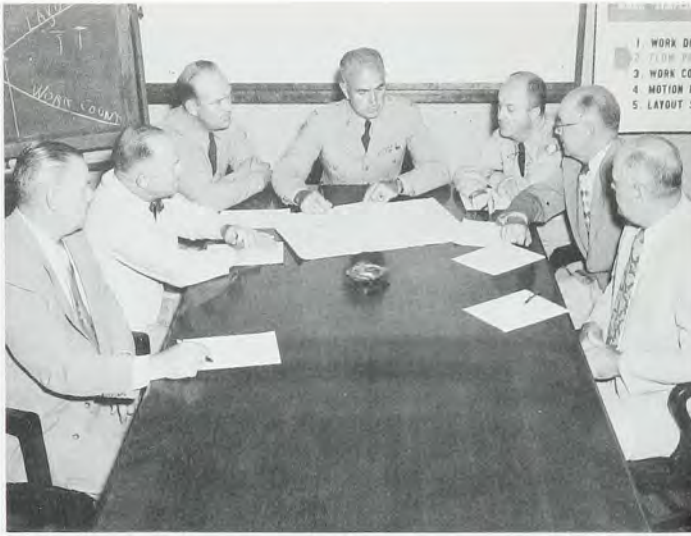




***There was nothing simple about building the intricate Atlas missile facilities near Altus in the early 1960s, one of the greatest military challenges ever faced by the Tulsa District.***



**Col. Stanley G. Reiff plans strategy in 1956. Varied military projects from that era included (clockwise from top right): Dedication of a new Veterans Administration hospital at Bonham, Texas; Fort Sill housing; Snow Hall, Fort Sill; and construction of Del Webb Mess Hall at Amarillo Air Force Base.**



Fort Sill photos courtesy of Fort Sill Museum



**The Tulsa District resumed military work in 1981, assuming construction and facilities maintenance responsibilities throughout the region. Far left, Col. Patete joined dignitaries at dedication of a new building at Reese Air Force Base. Left, groundbreaking for the Advanced Composite Repair Facility at Tinker Air Force Base.**

## **Chapter 4 READY IN PEACE OR WAR**

In 1980, **CHANGE WAS IN THE WIND**, blown in with the landslide victory of Ronald Reagan over President Jimmy Carter. Change was coming to the Tulsa District, beyond perhaps what even the most far-seeing leader could envision.

After two decades — the 1960s and 1970s — of being caught up in a civil works construction blitz, Tulsa District leaders entered the 1980s talking about a future *operating* mode.

The net effect of the Vietnam War had been to reduce military spending;<sup>1</sup> the effect of the Carter Administration had been to reduce new civil works construction starts. Then came the year of the worst inflation in 33 years — 1980 — which burst to life with the force of Mount St. Helens' eruption. A triumphant Reagan gained the White House and became further empowered with the first Republican-controlled Senate since 1954.

The Department of Defense began thawing plans for weapons systems that had been frozen during the Carter years.

The story is recounted in the 50-year history of the Corps' Southwestern Division: "Because of the large number of military projects mandated by the Reagan administration, the Fort Worth District was being overwhelmed. In contrast, by 1981 the Tulsa District's large Engineering Division was facing a reduction in force. The Southwestern Division suggested to the Office, Chief of Engineers, that Tulsa be allowed to resume military responsibilities. The headquarters agreed, and the Tulsa District took over responsibility for the states of Oklahoma and Arkansas.

"The transfer began in mid-1981 (and) was completed on 1 May 1982."

In 1981, military construction responsibilities were returned to the Tulsa District. It turned into a mounting wave of work so massive that by 1987 Col. Frank Patete announced that 65 percent of the District resources — an amazing 94 percent of its construction resources — were devoted to military tasks.<sup>2</sup>

It was

## **LIKE THE RETURN**

of old friends. The Tulsa District joined Seattle and Louisville Districts in receiving military assignments in late 1981. These reassignments balanced workloads and broadened the national base of military expertise to support mobilization.<sup>3</sup>

Restoring military responsibilities brought back some old friends to the Tulsa District: military installations the District had built during the 1940s or reactivated in the 1950s. Reassignment of duties from Fort Worth to Tulsa began quickly for four installations in Arkansas and five in Oklahoma: five Air Force bases, two Army posts, one Army ammunition plant, and one Army arsenal.

Tulsa assumed responsibility for 11 military construction projects expected to cost \$42 million. In fiscal year 1982 the district was designing \$81 million in military construction and supervising \$40 million of construction.

The reassignment papers were barely filed when, in May 1982 a major natural disaster in the form of a tornado ripped through Altus Air Force Base. The cost for repairs, designed and supervised by the Tulsa District, reached \$14 million.



***Tulsa District took the lead in repairing \$14 million in damage at Altus Air Force Base from the 1982 tornado.***

Photos courtesy Altus AFB



The orders:

## **BE LEAN**

**AND READY.** As the District added nearly 100 military workers and absorbed those shifted from Fort Worth, the civil works load also increased. That came with a transfer of civil design responsibility from the Little Rock District. But at the same time, the District was ordered to carry out a reduction in force in its civil employees. These profound realignments of staff and work were harbingers of things to come, reflecting the Reagan administration's philosophy that emphasized military preparedness and lean government.

By the end of fiscal 1982, Tulsa had 137 authorized military jobs; by the end of 1983, it had reached 259 (of a total District work force of 1,230). Yet even that growth did not reflect the true impact of the military changes, because at least 75 percent of the engineering and design work was done through outside architectural/engineering contracts. The installations had not been kept in good repair and needed modernized equipment. By June 1983, the District was involved with a \$190 million military construction program.<sup>4</sup>

Reassignments continued in 1985, when Arkansas military projects were transferred from Tulsa to the Little Rock District, in response to congressional pressure to avert closing the Little Rock District. In turn, Tulsa received the work of the Fort Worth District's Northwestern Area Office, relieving Fort Worth of some of its heavy military load. Tulsa assumed responsibility for two Air Force bases and the Department of Energy Pantex Plant in the Texas Panhandle.

As engineer to this growing slice of the nation's army, the Tulsa District served a clientele considerably different from the World War II armed forces. The U.S. had switched to an all-volunteer Army in 1972, so the armed forces of the 1980s tried to provide more comfortable and inviting living quarters.

A step

## **INTO THE NUCLEAR AGE**

came in 1987 not far from Amarillo, Texas. By 1987 the Tulsa District's military work was varied and complex, as challenging as any assignment ever given the District. Among the most sophisticated tasks were some highly complex nuclear weapons assembly facilities at the Pantex Plant near Amarillo. Pantex originally fabricated chemical explosives; then it was converted into the nation's only operating final assembly point for nuclear weapons. In 1987 the Tulsa District worked with the Fort Worth District and the U.S. Department of Energy to build a \$43 million addition to the plant.

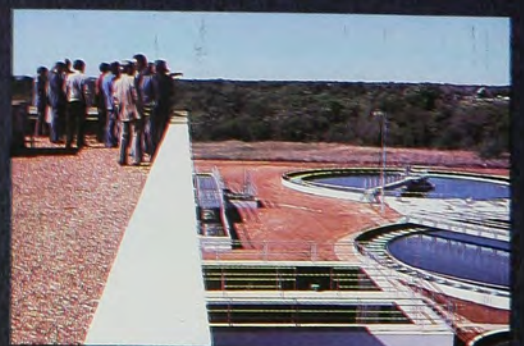
Among other special projects were the repair of Tinker Air Force Base Building 3001, cleanup of hazardous wastes at Pine Bluff Arsenal, and using the McClellan-Kerr Waterway for military transport.



**Unexploded shells are often found at Pat Mayse Lake, constructed on the lands once occupied by Camp Maxey.**



**Among the most challenging and important military work of the Tulsa District: building maintenance management for the Pantex Plant near Amarillo, the only U.S. final assembly point for nuclear weapons.**





Against a background photo of the aircraft support facility at Blytheville, these pages show some of the variety of Tulsa District military construction projects. Top row, left to right: Altus Air Force Base dining hall, exterior and interior shots; Altus consolidated operations/maintenance facility, under construction and completed; and a shipping and receiving building with chemical explosives blast walls at Pine Bluff Arsenal. Center left is a Fort Sill barracks complex. Bottom row, left to right: Tinker Air Force Base corrosion control facility; Tinker's wastewater treatment facility (two photos); a Tinker POL (petroleum, oil, and lubricant) storage complex; and unaccompanied officers' housing at Vance Air Force Base.



## REBUILDING TINKER'S 3001



**Col. Franklin T. Tilton**

**A spark from a welder's torch touched off a 17-acre fire on the roof of Building 3001, Tinker Air Force Base, in 1984 — leaving the U.S. critically short of facilities for unique defense work that normally is done in that building. The response: rush repairs in record time, under leadership of the Tulsa District. Operations continued in the building, even without the roof and even during snowstorms. Far right bottom photo, Col. Tilton and a representative of construction contractor Hensel Phelps sign the contract for repairs to begin.**

*It was the largest and most expensive reconstruction project ever undertaken by the U.S. Army Corps of Engineers and the Air Force.*

*It was so critical to national defense that the construction had to be completed in record time.*

*And it was accomplished on time, within budget, with no loss of life — under supervision of the Tulsa District.*

*What was it? The \$63.5 million reconstruction of a mammoth Tinker Air Force Base building named 3001.*

*Shortly before noon on Nov. 12, 1984, a spark from a welder's torch touched off a fire at Building 3001 that burned out of control for 40 hours, despite efforts of 500 firemen from 24 military and municipal installations. Three giant helicopters ran a kind of air bucket brigade, bringing water from Draper Lake in 1,000 gallon buckets, to no avail. The fire was sandwiched within the roof, rendering conventional fire-fighting techniques useless. Ultimately,*

*it was contained by cutting an 8-foot-wide firebreak through the roof.*

*When the blaze was out, Tinker officials surveyed the damage: 17 acres — 652,500 square feet — of roof was gone. Two thousand tons of structural steel and roof decking were ruined, along with utility lines and 12 major aircraft engine repair stations.*

*The building, with its solid masonry walls and high single-story maintenance bays, houses operations considered critical to the nation's defense. It is a vital Air Force Logistics Center, the largest of its kind in the world, for maintenance of Air Force aircraft and jet engines. Inside its walls is specialized equipment and processes needed to maintain, overhaul, and modify some 18,000 Air Force jet engines.*

*Two days after the fire, the Air Force called in the Corps for help, and set a completion date of September 1985, just ten months away.*



"We approached this job as if we were at war," one construction company executive said later.

The prime contractor was Hensel Phelps Construction Company of Greeley, Colorado. HTB, Inc., was awarded the prime contract for continuing architectural and structural work. C.H. Guernsey & Company, the major sub-consultant, was assigned all mechanical and electrical design responsibilities.

Demolition of the acres of roof, the miles of damaged piping systems and electrical conduit, required one month of around-the-clock work. Although most of the materials and processes were to be relocated, a 35,000-square-foot building had to be constructed in the damaged area to protect specialized, computer-controlled milling machines. By Jan. 1, engine overhaul had resumed.

Construction began in early March, before the design work was complete and before the scope of the work was fully known. Work proceeded at an emergency pace, despite snow that fell inside the

roofless parts of 3001 and piled up at an alarming rate on the shakey roof. "They never stopped work inside that building," recalled Weldon Gamel, then Tulsa District Chief of Engineering Division. "No place else does the same work, and it's essential for defense." Despite fears that the structural damage could cause the building to collapse, workers had to remove asbestos from the building before repairs could be completed. The risks paid off, and construction was essentially complete in August 1985.

"It could not have been done without the highly cooperative attitude and dedicated, persistent effort of all involved entities and their personnel," said Guernsey Chairman C.H. Guernsey, Jr. "This is a project in which all concerned may take justifiable pride in the successful and rapid restoration of a facility so vital to the defense of the United States."<sup>5</sup>



**The ten-month reconstruction project, largest ever for the Corps, required a veritable army of workers. Above, construction inspector Karen Rinaldi in safety gear. Below, after inspection of the burned-out hull, inspectors and field crews took the site by storm. Bottom right, complex contract negotiations produced agreements in record time — and a completed job ahead of schedule.**



## WATER-BORNE TROOP MOVEMENT COULD SAVE MILLIONS

**A**n idea hatched in the Tulsa District is being tested with great success.<sup>15</sup>

Although the U.S. navigation system was first developed by the Corps of Engineers for swift military mobilization, the waterway system has been rarely used for military deployment since World War II. Since that war, the nation has relied on rail and the interstate highway system for its extensive and expensive military training and troop deployment exercises.

But since the 1960s, half the U.S. railroad lines have been dismantled. And urban growth and traffic congestion make it more and more difficult for convoys to travel by roadway.

So the idea was born: Why not go back to waterway transport for mobilization? After all, the nation today has 25,000 miles of inland and intercoastal waterways, touching 30 states and 80 military installations. One-sixth of all intercity cargo is transported by water. And military movements are high-cost items today: the Military Traffic Management Command has an annual budget of \$3 billion.

Serious discussions about a test began between the Tulsa District and the Oklahoma National Guard in late 1985.

On June 4, 1987, the Guard moved a trial 34 pieces of equipment 89 miles along the Arkansas River from Camp Gruber, Oklahoma, to Fort Chaffee, Arkansas, for its scheduled annual training there. The heavy equipment was loaded on five deck barges moved by the towboat Elizabeth Lane. When the trip was completed, it was pronounced a success. Going back to the river route saved over half the cost of a similar movement by truck.

On June 7 the second leg of the trip began, with planning assistance of the Tulsa District. The Arkansas National Guard loaded 164 pieces of equipment on seven barges that were moved from Fort Chaffee to Camp Grayling, Michigan, for



mobilization training exercises. This trip took eight days and covered 1,450 miles over four waterways. Again, the savings were considerable: \$135,600 — an estimated 45 percent of the cost that would have been incurred by rail travel.

“This is a reawakening of military transportation on the inland waterways,” said Maj. Gen. Jerome Hilmes, Corps’ Southwestern Division Commander.

After seeing the savings in time and money from waterway use for military movements, the Military Traffic Management Command has officially informed commanders of the available savings and ordered them to inform all units under their command of the possibilities, reported the Tulsa World on May 22, 1988. The idea, born in the Tulsa District Economic Analysis Office, holds “great promise,” the World said.<sup>6</sup>



Now it catches the gleam  
of the morning's first  
beam,  
in full glory reflected,  
now shines on the stream

...  
— Francis Scott Key

*An idea whose time has come — again? Perhaps. America's water navigation system, originally developed to move military might, is again being used for military movements through an innovative Tulsa District pilot program. Movements of troops from facilities such as Fort Chaffee (top left photo) and the Arkansas National Guard (top right photo) in 1987 produced dramatic savings over other movement methods. The McClellan-Kerr Arkansas River Navigation System links with 25,000 miles of navigation systems — a distance equal to that of the earth at the equator. Waterway military deployment is seen by many in the Tulsa District as a link with — literally — the world.*

By 1987, Col. Patete calculated that the Tulsa District was providing construction and support for the Pantex Plant, two Army and five Air Force installations, eight reserve component commands, and 102 recruiting offices. The District was now involved in \$129 million in military construction work, compared to \$8 million in civil works.

“The work we do has a direct impact on today’s armed forces — soldiers, airmen, and their families,” Patete said.

“We’re currently working on . . . a \$25 million consolidated fuel control test facility under design for Tinker Air Force Base [and] Reynolds Army Hospital, a complex project underway at Fort Sill at a total cost of \$80 million to \$85 million . . .

“Some of our recent military construction work includes a consolidated operations facility at Altus Air Force Base and a gymnasium for Sheppard Air Force Base. At Fort Sill, we have three \$20 million barracks complexes underway and are nearing completion of one of the finest physical fitness centers in the Army.

“We also provide varied military real estate assistance in Oklahoma [and] a wide variety of support services to the installations, including design assistance. The average time for complete design of an installation support project is five months, one of the fastest average times in the Corps.”<sup>7</sup>

What did the military program mean to the Tulsa District? The new military mission focused the Tulsa work force again on the military roots of the Corps’ history, increased its national focus even as its regional construction mission was declining, and balanced its workload to retain a strong and vital District in the Tulsa region. At a time when the District was nearly middle aged, it provided an infusion of new excitement that helped keep the it moving forward rapidly into a complex and challenging future.

In 28 years of military assignments (1941–1961 and 1981–present), the District has provided more than \$2 billion in military construction, supplies, and services — \$1.3 billion between 1939 and 1961, and another \$785 million since 1981 — a noteworthy and lasting contribution toward our nation’s military health and strength.<sup>8</sup>

**Among new construction projects: The physical fitness center and swimming pool at Fort Sill, shown here in exterior and interior photos.**



## PINE BLUFF ARSENAL CLEANUP

**N**erve gas in Arkansas? Yes.

One of the lesser-known challenges facing the Corps in the 1980s was cleanup of a hazardous waste dump at Pine Bluff, Arkansas:

"Military construction in the late 1970s reflected the policies of President Jimmy Carter's administration . . . emphasizing environmental projects, particularly the cleanup of hazardous waste sites. This emphasis has continued to affect Army operations well into the 1980s.

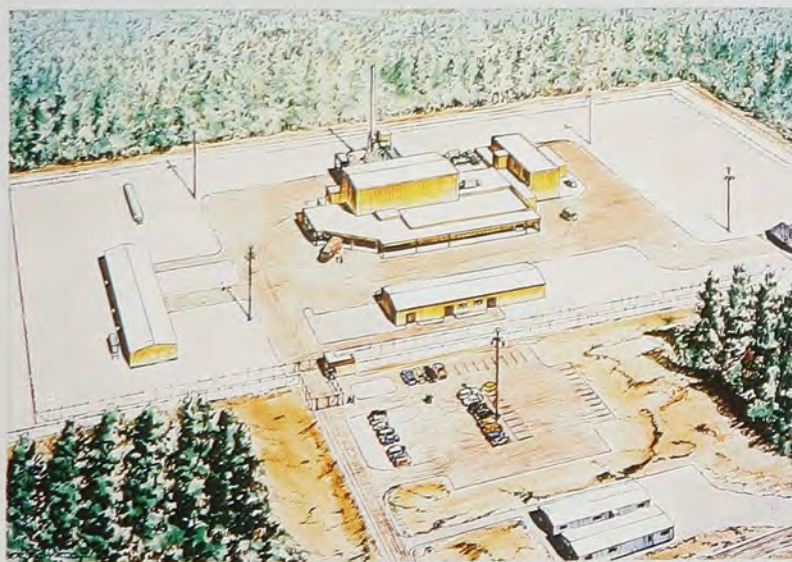
"Environmental experts began finding hazardous waste dumps — some of them now leaking — on military installations as well as on private lands. Many of these sites dated back to World War II, when they had not been considered dangerous.

"For example, at Pine Bluff Arsenal in Arkansas, the Army Chemical Corps spent much of the early part of World War II trying to develop a nerve gas in large quantities. The production line, however,

first produced large amounts of dichlorodiphenyltrichloroethane, shortened to DDT. This substance, an insecticide later discovered to be highly toxic to humans and animals, was simply stored at the arsenal as waste matter. Eventually the Chemical Corps solved its manufacturing problems and began to produce nerve gas in lieu of DDT.

"In the meantime, Germans had developed successful nerve gas production facilities that yielded only small quantities of DDT. When German officials learned of the large amount of DDT stored at the arsenal, they mistakenly concluded that the United States had large stores of nerve gas as well. So, luckily for soldiers on both sides, they chose not to initiate its use in war.

"The Southwestern Division is still working with the Pine Bluff Arsenal to contain and neutralize such wastes after more than 40 years."<sup>9</sup>



**Among the most difficult problems of our age: disposal of hazardous wastes. Shown here: hazardous waste landfills and an artist's conception of a B-Z disposal facility. Both are at Pine Bluff Arsenal, where the Tulsa District is responsible for disposal of hazardous wastes from World War II nerve gas and DDT.**

## **“FUDS” DOES IT**

*The 1960s Atlas missile underground silos were built in haste and abandoned at leisure.*

*The \$47 million Altus Air Force Base site in southwestern Oklahoma was a case in point, built in a crash program in 1960, then abandoned two years later when a new missile replaced the Atlas in the U.S. defense arsenal.*

*By the 1980s the abandoned sites were unsafe, possible sources of pollution, and targets for major “superfund” cleanup operations by the Tulsa District under a program called FUDS (Formerly Used Defense Sites).*

*When the Corps examined the cluster of Altus Atlas silo sites, they found unsealed caverns, 174 feet deep and 50 feet in diameter, in some cases used as garbage dumps, in others filled with contaminated water and leaking hazardous chemicals, said the Tulsa District’s Burl Ragland.*

*The first silo cleaned up by the District was at Granite, Oklahoma, in 1988. The silo and other underground structures were demolished, filled with dirt, and capped permanently with concrete, Ragland said. The project was completed at half its original cost estimate.*



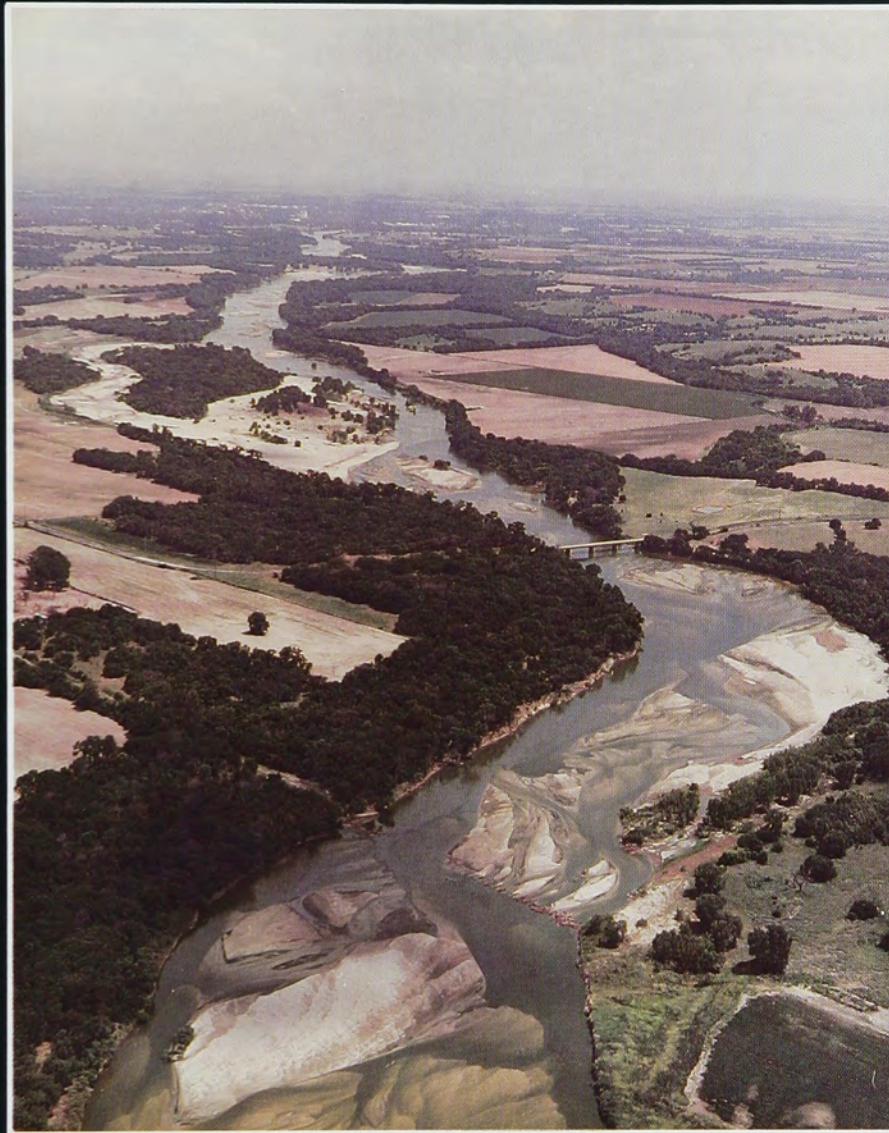
**The Tulsa District has filled and capped abandoned Atlas missile sites near Altus Air Force Base (shown during World War II).**



**Albert Trimble, left, and Burl Ragland at the entrance to the underground facility.**

**SECTION 4:**  
***POWER, POLITICS, AND PRAIRIE PORTS***

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## Chapter 1

# THE MOUNTAIN MOVERS

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*"Make no little plans;  
they have no magic to stir men's blood."*<sup>1</sup>

— Daniel C. Burnham

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The distinguished and

### **PERHAPS**

**UNPRECEDENTED RECORD** of the Tulsa District in civil works construction is focused around two projects: The Arkansas River waterway and, to the south, Denison Dam on the Red River.

Those two endeavors drew supporters and detractors encircled by constellations of other multipurpose projects and accomplishments, including:

- More than \$2 billion in savings from flood losses over the past 50 years.
- Navigation projects that have moved 50 million tons of goods through the region since 1971, breathing a new form of economic vibrance into many communities.
- Electric power projects that captured \$3.3 billion of energy from falling water, to light the valleys of a darkened region.
- Recreation projects that brought health and delight to 1.2 billion visitors throughout a region where the word "water-ski" was foreign even 30 years ago.
- Water supply and irrigation projects that made available more than 2 million acre-feet of water supply storage in the region of the dust bowl, where before farmer and city-dweller alike had so often witnessed the extremes of nature's drought and flood.



**The Tulsa District moved mountains to bring water resources development to its region.**

**Shown at right: Hugo Dam in southern Oklahoma.**



**Projects built by the Tulsa District have provided an estimated 46 billion kilowatt-hours of electric power. About 142 million tons of cargo have been shipped on the waterway navigation system. And the District's flood control projects have prevented about \$2 billion in flood losses, the Corps estimates. Tulsa District projects have provided 2 million acre-feet of water supply storage and logged 1.2 billion recreation visitors.**

In 50 years, the Tulsa District of the U.S. Corps of Engineers has moved mountains, literally. The audacious workers of the Tulsa District have reshaped the earth through bold projects that have changed, forever, the face of the region and immeasurably enhanced the quality of life of its people.

It was not the work of timid men.

In the broad range of salty tales about civil works, one should first look at the productive but short-lived Denison District, then at the Arkansas River Waterway and other major civil works projects that blossomed under the leadership of the Corps' office in Tulsa.

It was called

## **THE TEXAS CINDERELLA,**

and it was a hot afternoon in Denison, Texas — June 29, 1939 — when the news arrived.

The *Denison Herald* got out a fast extra edition. When it hit the streets, so did the townspeople. They closed up shops, and thousands danced through the town in an impromptu parade.

The *Herald* recalled it later as a spontaneous carnival and general celebration for Denisonians, who “streamed down Main Street to the accompaniment of blaring horns and general bedlam.” Some compared it to the celebrations when World War I ended.

The news? President Roosevelt had signed a bill allocating \$5.6 million to begin construction on Denison Dam. After years of planning, waiting, and worrying, the dam that would impound Lake Texoma was about to become a reality.<sup>2</sup>

For the depressed Denison region, it would mean \$53 million in flood control, electric power, water supply, and one of the most popular recreation areas in the United States. But even more, it meant jobs. It meant economic salvation.

Bob Kerr called Lake Texoma a “Cinderella” in 1960: “the largest body of water between the Great Lakes and the Gulf of Mexico . . . , the fourth largest man-made lake in the world [with] more visitors than any other government recreation attraction in the United States, including even Yellowstone National Park.”<sup>3</sup>

“Lake Texoma,” Kerr recalled, “was born of suffering.”

And it was not born easily. Oklahoma Gov. Red Phillips fought the project all the way to the U.S. Supreme Court, where a landmark decision established the responsibility of the Corps in public power projects.

Kerr tells of the beginning of the project, from one angle:

“The Red River in seven raging floods beginning in 1843 all but drowned the border town of Denison, Texas, as well as the bottom-lands. Nearly thirteen million acre-feet of flood-waters swept down the Red River in the angry flood of 1908. A young Texas legislator who lived just ten miles south of the river at Bonham decided there must be a way to stop these periodic rampages. From the day he came to Congress, Representative Sam Rayburn fought for flood control on the Red River. Finally, in the mid 1930s, long before he became Speaker of the House, Rayburn won approval of this mighty project to harness the river, hold back its waters, and generate electric power.”<sup>4</sup>

Even World War II could not stop the construction of Denison Dam, which continued from 1940 until 1945 despite the cry of critics (including opponents of the Rural Electrification Administration) who wanted the construction material diverted to defense work. Proponents argued that the project would provide power for wartime use.<sup>5</sup>

Before the dam could become reality, however, events would conspire to make it the focal point in a historic confrontation over public power in the southwest.

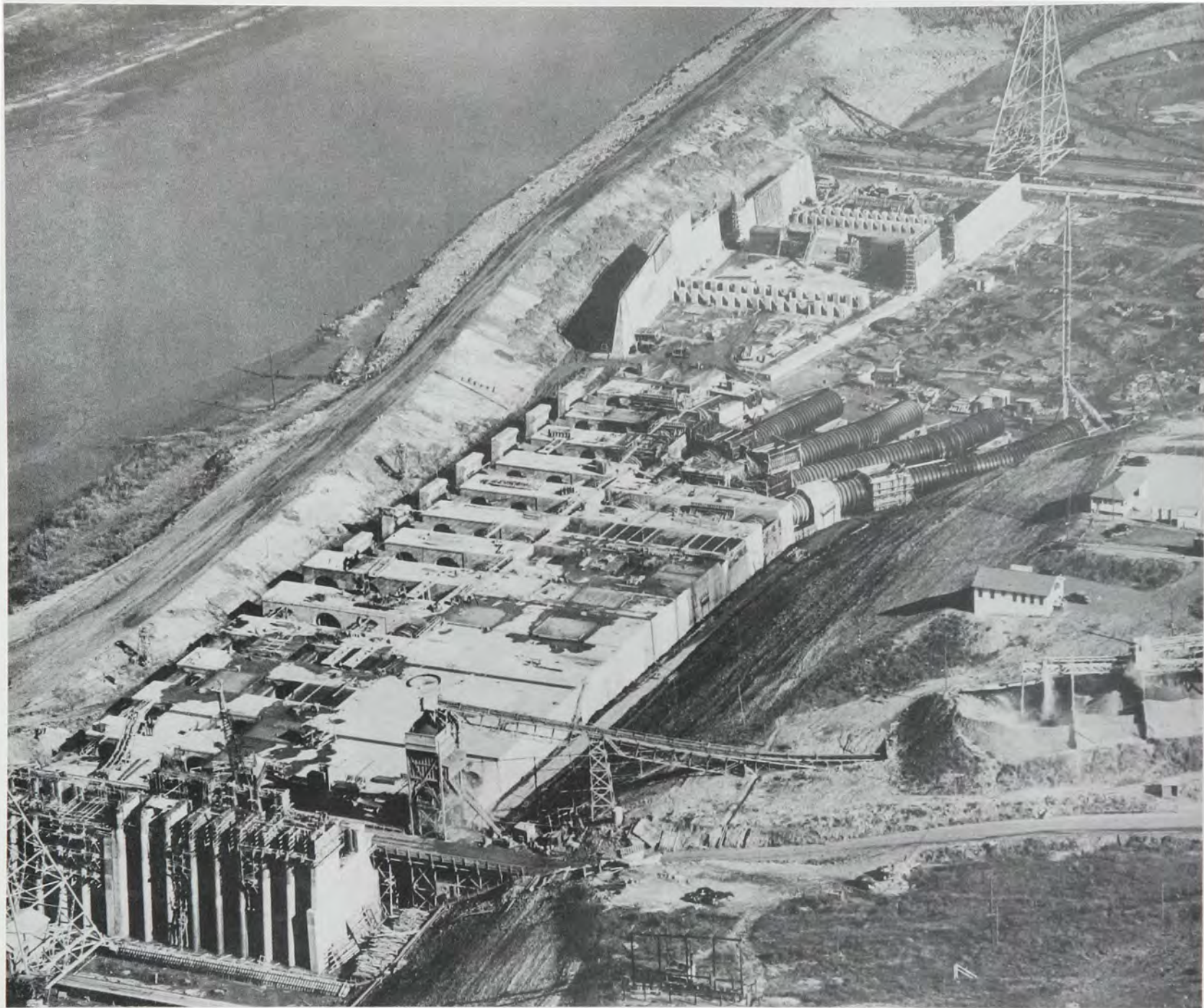
**1944: Corps' workers stocked Lake Texoma generously with fingerling bluegill fish (inset photo). A year later, eager fishermen were flocking below the dam.**



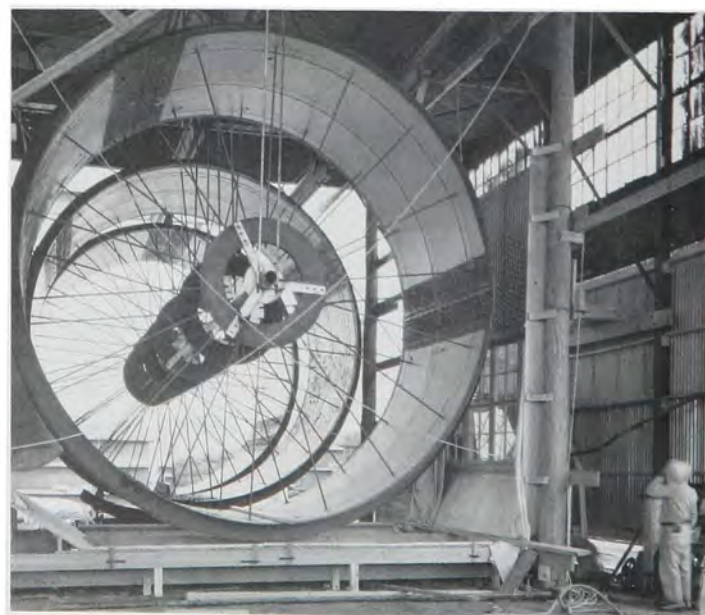


**Left: The dream of building Denison Dam arose on both sides of the Red River, shown here (from the perspective of the observation platform) before construction began in 1939. Bottom photo shows an artist's view of the proposed Denison Dam and appurtenant structures, looking toward the northwest.**





***By the fall of 1940, construction of Denison Dam was progressing rapidly. The October 1940 photo. above, shows construction of the intake structure, conduit section, and stilling basin, looking toward the northeast. Sections of the penstock, still in shipping crates, dwarfed the worker in the photo at right.***





**Top photo: July 1, 1944; was Dedication Day for Denison Dam. (Note: In deference to heat and fashion, nearly every man at the ceremony sports a summer hat.) Over subsequent years, Lake Texoma consistently set popularity records, often leading the nation in numbers of visitors to its sandy beaches (bottom photo) and quiet coves for relaxation and recreation.**

**Like as the waves make towards the pebbled shore,  
So do our minutes hasten to their end;  
Each changing place with that which goes before.**

**— Shakespeare**



For Denisonians

## **THIS WAS A**

**GOOD DAM IDEA**, especially for the cantankerous Red. From its beginnings in the high plains of New Mexico, the unpredictable Red River flows eastward toward the Mississippi, forming the boundary between the states of Oklahoma and Texas.

But while much support came from south of the river bottom, the idea of damming the Red near Denison actually arose on both sides.

On the Texas side, historian Settle singles out two Denisonians: George D. Moulton, “the father of the dam idea,” and Dr. Alex W. Acheson, who wanted to bring navigation up the river to Denison. Moulton championed the idea of a dam at Baer’s Ferry on the Red River at a site that the Corps eventually did choose. Moulton even created a model display of a dam at that location to argue his point.

On the Oklahoma side, Durant newspaper publisher G.W. Archibald became interested in the dam in 1933 and formed a close friendship with Rep. Sam Rayburn. This relationship turned out to be pivotal in the long fight to secure the dam. Archibald was even appointed for a time to the Oklahoma Planning and Resources Board, although he was later removed by Oklahoma Gov. Leon “Red” Phillips, whose opposition to the dam became legendary.<sup>6</sup>

The dam was also supported by rural electric interests who saw public power as the solution to the lack of energy in their regions.<sup>7</sup>

Other forces helped to bring the dam to reality. There were the vigilant Chambers of Commerce in Denison and Durant; the active Red River Flood Control and Navigation Association at Denison as well as the Oklahoma Red River Flood Control Association at Durant. There was even the Red River Valley Improvement Association, which included members from Texas, Oklahoma, Louisiana, and Arkansas.

A 1928 analysis by the Corps’ Vicksburg District had found insufficient economic justification for a navigation, flood control, or hydroelectric power project in the Denison area. But after a 1938 restudy, again by Vicksburg, the Corps recommended construction of a \$54 million dam for flood control and power.

Congress authorized the project in 1938. It had, of course, the backing of Sam Rayburn, who personally won the support of President Roosevelt. Years later, after Texoma was filled, Rayburn would affectionately call it “my lake.”<sup>8</sup>

By this time the area was under the jurisdiction of the Little Rock District, which had been created in 1937 and included the Red River basin above Fulton, Arkansas.

It was a period of great movement on federal water resources projects. “I can get money for a dam easier than I can get money for my own breakfast,” said Oklahoma Sen. Elmer Thomas, who sliced the Corps’ money pie as chair of the Army appropriations subcommittee.

It was

## **RED AGAINST THE RED**

dam. The project was marching along at record speed until it struck opposition in the person of the angry Oklahoma governor, a proponent of private, but not public, power. Red Phillips, whom historians classify as a reactionary, fumed and fought Roosevelt’s New Deal ways, and according to him, damming rivers was one of those ways.

With “consuming obsession [and] unfurling the discarded banner of state’s rights, the governor threw up every possible obstacle to Washington’s construction of dams on the Red and Grand rivers,” according to Oklahoma historian Danney Goble, who notes that Phillips considered FDR a “crackpot” who would “destroy this country and the institutions we love.”<sup>9</sup>

Historians speculate that Phillips was a voice for private power interests. For whatever reasons, he contended that the power production facilities made the project illegal. At his insistence, the spillway was lowered 20 feet — reducing the area of impoundment and prompting critics to blame the Corps 20 years later when the June 6, 1957, flood topped the spillway.<sup>10</sup>

But modifying the project didn't mollify Phillips, who filed suit in 1939 to stop construction. Work continued, however, as the case wound its way to the U.S. Supreme Court. The justices ruled in 1941 on behalf of the Corps.

The Denison office, created Jan. 1, 1939, was headed first by Capt. (later Lt. Gen.) Lucius D. Clay, who was transferred from McArthur's staff in the Philippines to oversee dam construction.<sup>11</sup>


Clay, who would later become military governor of the U.S. Zone of postwar Germany, in 1940 was followed at Denison by the one-year term of Capt. Gordon E. Textor. In July 1941, Maj. William W. Wanamaker, a West Point graduate and Massachusetts native, assumed command. Wanamaker saw the construction through most of its life and served during the peak period of Denison work, when as many as 5,200 employees (including 3,720 in military construction) worked in the Denison District.<sup>12</sup>

The final Denison District Engineer was Maj. Emlen J. Wanless, who served there from 1944 to 1945, when the dam construction was virtually complete.

By the end of 1944, both military and civil works construction in the Denison District had tapered off, and further decline was predicted.

It was nonetheless a surprise for Denison when, in March 1945, Southwestern District Engineer Marks announced that the Denison District would become a suboffice of the Tulsa District, "in line with economy and manpower conservation." Denison's responsibility for the Trinity River Basin was given to the Galveston District.

Effective April 1, 1945, the Denison District's short but distinguished life ended. Denison was folded into the Tulsa District, which assumed responsibility for the Red River basin above Fulton, Arkansas, and for all military work Denison had underway.

<b>RESTRICTED</b>	(G.O. 5)
GENERAL ORDERS } NO. 5	ARMY SERVICE FORCES, OFFICE OF THE CHIEF OF ENGINEERS, WASHINGTON 25, D.C. 16 March 1945.
<p>ABOLISHMENT OF THE DENISON ENGINEER DISTRICT.—1. By authority of the Secretary of War, the Denison, Texas, Engineer District, 9808th TSU-CE-Det. No. 2, with headquarters at Denison, Texas, established by General Orders No. 2, Office of the Chief of Engineers, 22 December 1938, is abolished effective 1 April 1945 and is redesignated as a sub-office of the Tulsa District.</p> <p>2. Effective 1 April 1945, the Galveston, Texas, Engineer District, 9808th TSU-CE-Det. No. 3, will be expanded to include the watershed of the Trinity River.</p> <p>3. Effective 1 April 1945, all civil works now under the Denison District (except those pertaining to the civil works of the Trinity River) will be transferred to the Tulsa, Oklahoma, Engineer District, 9808th TSU-CE-Det. No. 6. All military construction now underway in the Denison District will be transferred to the Tulsa District and completed by that District.</p> <p>4. The Division Engineer, Southwestern Division, 9808th TSU-CE, will effect the necessary transfer of personnel, property, records and funds.</p>	
	<p>THOMAS M. RODINS, Major General, Deputy Chief of Engineers.</p>



**Two Denison District Engineers, Major Emlen J. "Jack" Wanless, 1944-1945 (left), and Major William W. Wanamaker, 1941-1944, compared notes as Wanamaker left Denison command. Wanless was the final Denison District Engineer. Under the terms of General Orders No. 5, Denison District was merged with the Tulsa District on April 1, 1945.**



## Chapter 2 A CIVIL ARMY

*“Conceived in dust  
Cradled by flood  
Created by men.”*

— Inscription on Arkansas River Waterway dedication plaque (by Col. Vernon A. Pinkey)

The story flashes again to July 1, 1939, when Tulsa’s first District Engineer, Capt. H.A. Montgomery, and 278 employees began work as the Tulsa District. Crates, boxes, and nail kegs served as the first furniture in the scattering of the Tulsa District’s initial offices in the Petroleum Building.

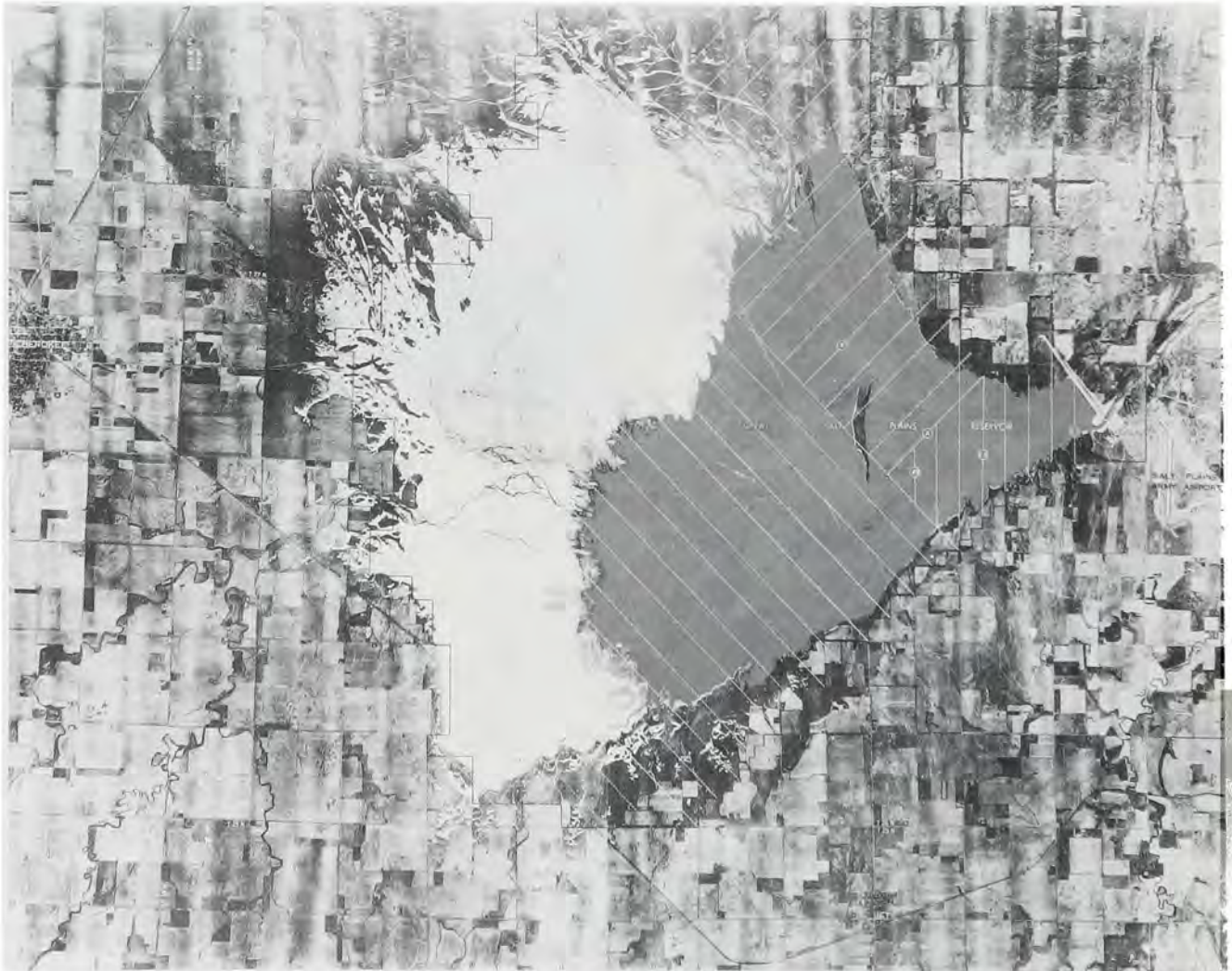
Like a civil army, the new crew stepped into a moving river of pre-existing activity.

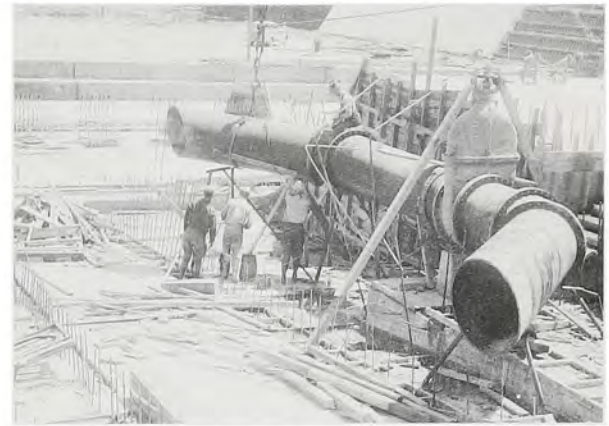
To the west, construction was already underway for Great Salt Plains Lake on the Salt Fork of the Arkansas and for Fort Supply Lake on Wolf Creek of the North Canadian River. Hulah Lake on the Caney and Optima Lake on the North Canadian had been authorized in 1936, Canton Lake on the North Canadian in 1938.<sup>1</sup>

Even more significant was the work of planning: outlining visions for plans, programs, and projects that would guide the work of the district for the next 50 years. Although World War II stalled or stopped most civil works construction projects, planning continued in the District at a brisk pace throughout much of the war.

The planning process, of course, was intended to provide a vehicle for identifying and resolving issues. It was an exciting time, when major foundations of public policy were being forged — and there was no shortage of major issues to be debated.

**1939: Two lakes were under construction in western Oklahoma when the District was formed. Salt flats at Great Salt Plains Lake, deposits from ancient inland seas, stand out in stark contrast to the surrounding lands in this early aerial photo. Lines on the lake are were set to measure sedimentation rates. The unusual pattern of lines occurred because early equipment could not accurately measure long distances. The left photo shows 1941 construction on the Fort Supply spillway weir.**





**1938: Building Great Salt Plains Dam got underway in earnest with horse-drawn equipment such as the asphalt spreader shown in left upper photo, based on technology of oil drum and perforated pipe. Horses' legs were oiled to reduce asphalt burns. Upper right, a 36-inch bypass pipe and valve was erected through the intermediate weir.**



**Center photo shows embankment site testing; lower right photo, a direction sign erected by the "War Department." Lower left, the completed Great Salt Plains Dam.**

Behold

## **THE GRAND DEBATES.**

Behind any dam, only a finite amount of water can be contained, and heated controversies arose about competing needs for that water storage. A case in point was the debate over uses of water behind Pensacola Dam on the Grand River in northeastern Oklahoma.

Pensacola Dam was under construction by the Grand River Dam Authority when the Tulsa District was formed in 1939. The GRDA dam had a single purpose: hydropower production. But the Corps determined, meanwhile, that flood control was also needed. It concluded that such a use could be justified economically at not only that site but also at two others on the Grand: Markham Ferry and Fort Gibson.

The Public Works Administration, which had granted \$20 million toward the Pensacola construction, insisted that most of the reservoir storage be reserved to hold water that would generate hydropower. But flood control advocates such as Tulsa's Newt Graham warned that increasing power storage reserves would reduce the space that should be reserved to hold flood water. This, he claimed, would threaten those in the flood plain below the dam.

In a historic confrontation, Tulsa District personnel and Col. Eugene Reybold, the Southwestern Division Engineer, argued against sacrificing needed flood control storage for power-only projects on the Grand River. Reybold (who became the Corps' Chief of Engineers in 1941) also argued that the projects' impact was so broad that the decisions on project use and operation, including power marketing, should be made only by Congress.

The issues were settled, at least initially, in 1941 when Congress upheld the Corps' position and included the Pensacola, Markham Ferry, and Fort Gibson projects in the comprehensive flood control plan for the Arkansas River. The effect of this action, because Pensacola had already been built by GRDA, was to authorize the Corps to manage the flood control features at Pensacola and to build dams at Markham Ferry and Fort Gibson. (But, after later changes, GRDA — not the Corps — built Markham Ferry.)

That congressional action, the Flood Control Act of 1941, also extended the Arkansas River comprehensive flood control plan to include the Verdigris River basin in Kansas. It authorized dams near Toronto, Neodesha (never built), Elk City, and Fall River in Kansas.



**Master dealers in “white gold” — water politics — included (left to right) Col. Wilson, Senator Bob Kerr, Glade Kirkpatrick, and Newt Graham.**

The spark came

## **WITH THE FLOOD OF CONVICTION.**

In 1939 the Chief of Engineers was authorized to restudy and update the "308 Report," an overall plan for the region's water resources along the Arkansas River and its tributaries in Oklahoma and Arkansas.

It was a process that would consume much of the Tulsa District's time until at least 1943, with as many as 300 Tulsa employees working on a new plan called the "758 Report." Representatives of the Southwestern Division as well as Tulsa and Little Rock Districts were named to an Arkansas River Survey Board created to guide the study.

Its primary purpose, as Settle points out, was "to determine whether improvement for dependable navigation was economically justified and to determine hydroelectric power potentials on the mainstem and tributaries in those two states."<sup>2</sup>

As if to highlight the need for civil works, some of the worst flooding in the region's history occurred in 1941 and 1943. The late Tulsa consulting engineer Bill Fell recalled the period as having three "1000-year floods" during the time he and other engineers were trying to close the Pensacola Dam. The month of October 1941 was the wettest in Oklahoma records to that time, and the 1941 flood between Muskogee and Fort Smith was counted then as the largest of the century.

It was, however, quickly exceeded by the floods of May 1943, when rainfall as great as 24 inches in six days, centered near McAlester and Muskogee, set flood records that still hold today. To make matters worse, the flows from three uncontrolled streams — the Grand, Verdigris, and Arkansas — all reached their peak levels at the same time near Muskogee, producing a river nearly 50 feet deep running at 700,000 cubic feet per second. Damages have been estimated in the \$50 million range, and more than a score of people lost their lives.

The 1943 flood forged a firm flood-control partnership among Newt Graham, his long-time ally Don McBride, and Oklahoma's new Governor Bob Kerr who later called it the "flood of conviction."<sup>3</sup>

Other fighters for flood control included Victor Barnett, associate editor of *The Tulsa Tribune* and the 1940 president of the Tulsa Chamber of Commerce; Glade Kirkpatrick, chairman of the Chamber's waterway committee; and Russell Rhodes, Chamber executive officer.

Graham was convinced that flood control was a key to providing navigation for the region. His belief was partly verified when the four-year "758 report" was completed in 1943. It showed that the best plan for Arkansas River water resources development would combine navigation, hydroelectric power, flood control, and other beneficial uses.



**Don McBride**



**Robert S. Kerr**



**John McClellan**

## THE 1943 "FLOOD OF CONVICTION"

*The flood of 1943, a disaster of monstrous proportions, came suddenly in a time of drought and changed the life of a new Oklahoma governor, Bob Kerr — and, through him, the lives of all citizens of the Tulsa District region.*

*It began, Kerr recalled, in sudden gusts of wind on Friday, May 7, 1943, that carried drops of rain. Drought-stricken farmers welcomed the rain until, as days wore on, it fell unceasingly. Kerr wrote:*

*"All day Sunday the rain fell, more than seven inches of it . . . As waves of muddy water from creeks and streams and tiny rivulets rushed into the Arkansas, the river rose, and its sound changed from a gentle lapping to a roar. And still the rain came down.*

*"To the farmers around Webbers Falls, the steady beat of rain on their roofs and dripping from the eaves took on a new and ominous sound . . . The bottom lands were filling. The invading waters swirled across the barnyards and against the houses themselves. The radio, turned on while the family sat quietly around the breakfast table, brought warnings. The Arkansas River was rising . . . An earthen*

*dam near Siloam Springs was crumbling. A hundred and fifty soldiers were marooned in a small town upriver. Roads were flooded . . .*

*"And still the rain fell. By late Monday night Webbers Falls was a deserted village . . . There were desolate scenes all along the route of the swollen Arkansas — crops under water, rescue boats searching for marooned families, frightened farm animals huddled on high ground, streets awash, small bridges torn loose, debris frothing and bobbing in the river. Twenty-three persons were reported lost . . . Ninety per cent of the crops over hundreds of square miles in northeastern and eastern Oklahoma were destroyed . . ."*

*It was only four days later, Kerr recalled, that "at first faint and far away, again came rumbles of thunder. The distant sky was lit with lightning." And then — "a great storm broke over the flood-tortured area of eastern Oklahoma. Farm buildings in some places were blown over like paper cups. The rains were so heavy they sounded like pebbles*

**The 1943 flood ranks among the worst ever recorded in Kansas, Oklahoma, and Arkansas. From that disaster arose a new commitment to solve flooding problems, led by the likes of Gov. Bob Kerr.**



dashing against the roofs and sides and windows . . . .”

The week that followed brought “the worst flood in the recorded history of eastern Oklahoma,” Kerr wrote. “In some places, 15 inches of rain fell in a two-day span. Tulsa had sixteen inches of almost continual rainfall . . . .”

The three rivers of the Three Forks area all peaked at flood stage simultaneously, carrying 700,000 cubic feet of water per second past Muskogee — twice as large as the flood the previous week. The Arkansas River was as much as 50 feet deep and eight miles wide.

“In a five-hundred mile swath of reckless anger, the waters rolled over the land, houses, farms, stores, factories, highways, and acres of grain and food. Planes flying over the desolate area to spot marooned families saw white faces of terror-stricken people on a bridge waiting to be rescued, four persons on a farm house frantically waving a white table cloth in the hope of being spotted, and islands of high land where people and animals huddled in common shelter

. . . . Fire and typhoid threatened every community . . . .”

When the water receded, baring new scenes of damage and loss, Kerr toured the area and recalled one farmer in particular, S.W. Armstrong, in the Vian Bottoms:

“We sat on a cottonwood log, brushing away the insects, and talked. He was a light, wiry man who wore a wide brimmed straw hat over a face leathered by wind and sun, and his trousers were held up by red suspenders. He sat despondently kicking his foot in the sand and said, ‘I have spent my whole life developing this acreage, and making it produce for me.’ He picked up a handful of the fine sand and let it drop through his fingers.

“‘Now,’ Armstrong said bitterly, ‘pick any part, and I’ll sell it to you for fifty cents an acre.’”

It was “a turning point,” Kerr recalled. From the desolation and destruction of the 1943 flood, “a citizens’ crusade was born to reduce or stop this needless waste and misery.” The leader of the crusade would be Bob Kerr.<sup>4</sup>



This was

## **AN AWESOME CHALLENGE,**

this plan that called for a navigation system from the Mississippi clear up to Catoosa near Tulsa. The system would travel up hill toward the landlocked regions. It included channel cutoffs, canals, bank stabilization, dredging, snagging, the building of 34 locks and dams (later reduced to 17), along with three sediment control dams and other impoundments.

The report, Settle summarized, outlined those challenges: “the awesome challenge of sediment control; inundation of and removal from production of fertile farmlands; the displacement of people and communities; costly relocations of highways, bridges, utilities, and public buildings; bank stabilization; construction sequence and schedule; future decisions as to route below Little Rock; and technical aspects of the system.”

And with annual costs estimated at \$19.5 million, the report established the benefit-to-cost ratio at a razor-thin 1.01 to 1.00, barely above the 1:1 minimum ratio required for favorable consideration.

“A lot of people had to do some unpopular things to get this off the ground,” recalls Francis Wilson, who as district engineer signed the 1945 report that declared the Arkansas navigable. In his later years, Wilson would speak with pride of that decision and recall the criticism he received then. “Some of my old friends called me aside and said, ‘Son, why did you ever put your name on a thing like that?’”<sup>5</sup>

Now the real confrontations began, inside and outside hearings, meetings, and plan revisions. On the one hand, the Tulsa District reckoned with Graham and other navigation advocates who argued that the report understated benefits and overstated costs. On the other hand, it dealt with opponents such as railway companies and groups who wanted the plan to give priority to hydropower production rather than flood control and navigation. Some wanted to build flood control works upstream in the watershed, others downstream — and still others not at all.

Never underestimate

## **THE WHITE**

**HOUSE CONNECTION.** Revised, scrutinized, and revised again, the plan by the fall of 1945 estimated costs that were reduced by more than \$400 million because new federal legislation shifted power transmission and disposal costs to the Department of the Interior. By August 1946 the plan had a benefit-to-cost ratio of 1.08 to 1.00.

And it was still stalled in Washington — until Governor Kerr, Don McBride, and Newt Graham presented it to President Harry S. Truman in a special White House meeting Aug. 17.

In less than a month, the report was issued, but the Board of Engineers for Rivers and Harbors recommended that the navigation portions be deferred for further study. Sept. 20 Eugene Reybold (by that time Chief of Engineers in Washington) in effect overruled the Board. Gen. Reybold said he was “fully convinced that the construction of the navigation features is fully warranted and should be authorized at this time.” With additional modifications, the benefit-to-cost ratio improved still further, to 1.2 to 1.0.

Now the campaign for congressional passage stepped up. Graham and his friend John Dunkin helped organize the Arkansas Basin Development Association and, in one fabled dinner party, raised \$80,000 to wage the campaign.

They had a chance to mount the crest of a wave, because the government was looking to water resource projects as one means to stabilize post-war employment.

On the other hand, a fight against congressional authorization was mounted by powerful Oklahoma City newspaper publisher E.K. Gaylord, who denounced the navigation project as bad fiscal policy, and Gaylord’s ally, Oklahoma Congressman Mike Monroney, who wanted the Arkansas waterway project delayed for further study.

# TULSA WORLD

"Oklahoma's Greatest Newspaper"

EUGENE LORTON

1869-1949

Page A-14

Saturday, November 5, 1988

## Col. Francis Wilson

YOUNGER Tulsans have no way of knowing what a tremendous, sustained effort it took by farsighted citizens throughout the 1930s, 1940s and 1950s to conceive and bring into being the Arkansas river navigation system.

The project dwarfed a better-known one, the Panama Canal, involving 18 locks and dams to make it possible to bring barges up the Mississippi and the Arkansas rivers to a point northeast of Tulsa.

Col. Francis J. Wilson, who died Thursday, was a key figure in giving the project respectability in the 1940s and in getting construction to the point that the system's completion was a foregone conclusion.

As head of the Tulsa District of the U.S. Corps of Engineers from 1942 to 1946, he directed the report which called for multi-purpose development of the Arkansas and was adopted by Congress.

After retiring from the corps in 1946, he became executive vice president of the Arkansas Basin Development Association in 1952, holding that post until 1969 and staying on as a consultant for several years after that.

In 1969, Wilson was described as "the driving force" behind the project. He was an engineer and a visionary who knew man's ingenuity could improve his environment.

Col. Francis J. Wilson: A good man who worked for a dream and lived to see it come true.



*As the Tulsa World recalled at the time of his death, Col. Francis Wilson epitomized leaders who brought Tulsa District plans into reality. Wilson is shown here with The Tulsa Tribune reporter Joe Howell (left) at a 1987 Arkansas Basin Development Association conference.*

Some believed Gaylord's interest was territorial, favoring Oklahoma City at Tulsa's expense; others that he was caught up in the "upstream/downstream" philosophical debate.

But Monroney's delay amendment failed, 42 to 99, and in the summer of 1946 Congress approved the Arkansas waterway plan and \$150 million for its construction. Finally the waterway plan was official.



## Chapter 3

# A WATERWAY UNDERWAY — EVENTUALLY

*“A harbor, whether for ships or ideas, is a good thing, for it invites the world to come and go, and the life in it grows strong because it takes something from the world and has something to give in return.”<sup>1</sup>*

Finally the waterway was underway. Or was it?



### THE ART OF WILLOW MATTRESS MAKING

*During those years around the turn of the century, a trend developed to protect areas along the river’s path through bank stabilization.*

*Floyd M. Clay in A History of the Little Rock District Corps of Engineers wrote that bank stabilization in those days was a developing science. The first step was to find a willow grove, second to cut it, and third to haul the trees to the site where massive willow mattresses were woven by hand and anchored to an unstable bank.*

*“Weaving of willows was an art . . . , and one in which both hands and clothes would take a tremendous punishment. The mat joints were secured with wire, and the combination of wire, splinters, heat, humidity, and mosquitoes made one confident that he had earned his \$60 per month (\$90 base pay, less \$30 for subsistence),” Clay reported.*

*If nature took its course and caused other trees and saplings to grow through the mats, taking root and anchoring them firmly, the mats could hold the banks for years and even decades.<sup>2</sup>*

True enough, in the summer of 1946 President Truman signed the River and Harbor Act that finally authorized Corps' construction of the Arkansas River navigation system.

But then nothing happened. It would be another decade before construction would begin, and 15 years beyond that before the first barge would make its way to the head of navigation.

That quarter-century of events would be filled with drama aplenty. Throughout that first decade, the question of whether the waterway would be built was posed again and again. Ultimately, as Settle notes, that question was answered not by the Corps but by local interests and the Congress of the United States.



***Building on techniques developed in willow mattress weaving around the turn of the century, stream and bank stabilization devices used today create their own unique river rhythms. For example, left photo, shows striking patterns on the Arkansas River between Mayo and Kerr Locks and Dams.***

***Our lives float on quiet waters . . . down softly flowing streams, where silvery willows shadow calm waves . . .***

***— B.S. Wagstaff***



To tame the

## **SPOILED MISTRESSES**

would take getting past the skeptics. In the years following 1946, Congress began doling out funds for work on some dams in the system that included flood control, but the navigation parts of the system were conspicuously skipped over.

Both within and without the Corps, commitment to the project was far from unanimous.

Settle reports that some highly placed engineers in the Corps were skeptical — to put it mildly — about the technical and marginal economic feasibility of the navigation project.

This would not be an ordinary engineering project. It would be the largest the Corps had ever done, maybe the largest anywhere. And technical problems loomed large. The kindest thing to say about the Arkansas River was that it was unstable.

“The Arkansas River and its tributaries were like spoiled mistresses, given to fits of uncontrollable rage and prolonged spells of stubborn torpidity,” wrote Jim Henderson in a special issue of *Tulsa Magazine*.

“Especially was the Verdigris an unlikely channel for marine traffic. One day you could walk across its bed without getting your socks wet, the next day it would burst from its banks and flood the farmlands and towns.”

It was true that overnight the Arkansas could change from a trickle to a torrent. At flood tide, the banks of the river could wander as much as 1,000 feet from side to side, chewing up bank stabilization devices and spewing their remains downstream. Even worse, the very bed of the river was a roller-coaster of shifting, shoaling sand. During a typical year, it carried 100 million tons of sediment past Little Rock. This monumental gift from nature would have to be somehow contained, then continually dredged to create and maintain a barge channel.

Furthermore, the steep Arkansas River valley rises an average of a foot a mile. By comparison, when traveling upstream on the Mississippi from New Orleans, a barge rises only 100 feet in the first 500 miles. But the Arkansas River waterway is a steeper climb, rising 420 feet in its 445-mile length. To reach Catoosa, barges would in essence have to climb a water staircase 445 miles long and 420 feet high. This would require 17 expensive locks and dams.

“This was the last undeveloped inland waterway in the country and it was undeveloped for good reason,” Henderson wrote. “No one — almost no one — believed it could be done, not at a reasonable cost anyway.”



**Some flooding problems in the 1940s and 1950s seemed to get worse every year and pointed up the need for coordinated, comprehensive water resource development in the District.**

It was called

## **A WHITE ELEPHANT IN A PORK BARREL.**

If some elements in the Corps were cool to the waterway, so were some key players in Oklahoma, including Oklahoma Gov. Roy Turner, Oklahoma City publisher E.K. Gaylord, Tulsa's Congressman George B. Schwabe, and Tulsa oilman W.G. "Bill" Skelly.

Henderson contends that Skelly had railroad interests he wanted to protect against waterway competition. Railroad or no, he opposed the project only until he lost 800 acres of crops to a flood along the Verdigris; then he volunteered his services.

"Let's get the damn thing built," Skelly proclaimed.<sup>4</sup>

The national — and sometimes international — press was even less than cool to the waterway; they were hot on the trail of Senator Kerr's power and what some had no hesitation in calling a pork barrel project.

"More than any one man, . . . Kerr, the wheeling and dealing Oklahoma Democrat and oil millionaire, hooked this enormous . . . piece of pork out of the barrel," *Fortune Magazine* contended.<sup>5</sup>

*The London Economist* asked whether the project was a "white elephant in a pork barrel" but ended its analysis by speculating that the waterway just might produce an "economic miracle" in the resource-rich Arkansas basin. "It is," *The Economist* conceded, "a glittering prospect."<sup>6</sup>



**1951 floods in Emporia (top photo) and Halstead, Kansas.**



**Myron DeGeer (left) and Ray Broyles (right) briefed Southwestern Division General Parfett on Tulsa District projects in the early 1970s.**

### **SHORT MOUNTAIN TRIP SELLS WATERWAY IDEA**

*It was sometime around 1951 that a dignitary-loaded barge struck out from Fort Smith, churning upstream on the Arkansas and Poteau Rivers.*

*Aboard were Oklahoma Sen. Bob Kerr, Rep. Ed Edmondson, and a crusading Fort Smith newspaper editor whom some would later call the father of Arkansas River navigation: C.F. Byrns. Among others on board was Corps' Engineer Webster Boland. "For weeks, or possibly months, Mr. Byrns had been bombarding Washington to send officials to see what the river was doing to the rich land in the Moffett Bottoms," Boland said. "Finally his persistence paid off. And*

*the things the officials saw that day were shocking. Huge hunks of rich soil were falling into the river, disintegrating into mud and mingling with other topsoil that raced down-river to the Mississippi and on out to sea."*

*The river was threatening to demolish U.S. Highway 64, the major route into Fort Smith from the west.*

*It was only a barge trip. But the view from the deck showed first-hand the problems and possibilities of the Arkansas River. That view was pivotal, in Boland's recollection, to bringing the waterway dream to reality.<sup>7</sup>*

For awhile it was

## **THE ROAD TO NOWHERE,**

meaning it was a project with energetic backers but without support from some key players.

Kerr, Don McBride, Newt Graham, and other advocates for the project were picking up supporters along the way, of course, — such as Fort Smith newspaper editor Clarence F. Byrns, Arkansas Senators Fullbright and McClellan, and Tulsans John D. Mayo, Glade Kirkpatrick, John Dunkin, Gary Vandever, E. Fred Johnson, and (later) Oklahoma Representatives Ed Edmondson and Page Belcher. Even Oklahoma Senator Mike Monroney, who initially opposed the waterway, later “came around whole hog,” one supporter recalled.<sup>8</sup>

Kerr, ineligible to succeed himself as governor, was elected Oklahoma senator in 1948, two years after the waterway was authorized, although he said he almost lost the Senate race because “the oil men found out I was a New Dealer, and the New Dealers found out I was an oil man.”<sup>9</sup>

But still the waterway’s vision was sputtering . . . and the proposed project had plenty of company on the road to nowhere. More than 900 water projects had been authorized but not started, prompting a U.S. House committee to review their status beginning in 1951. Those 900 projects were estimated to cost \$8 billion, nearly as much as the total cost of all civil works projects that the Corps had completed or had underway.

The Arkansas River waterway was caught in the review. In 1954 General Chorpene (the former Tulsa District Engineer, now Assistant Chief of Engineers for Civil Works) scrapped the waterway from the active list and declared it “deferred for further study.”

The Corps was whipsawed between Congress and local interests pressing for the project, and opponents in the Eisenhower administration — including the Bureau of the Budget. Even within the Corps, for the early years of the 1950s, a hard nub of opposition was in power in the Corps’ Washington office: Chief of Engineers Sturgis, his Assistant for Civil Works Itschner, and their Executive for Civil Works Whipple.

So firm was their opposition that, as late as 1955, the Corps was using outdated benefits information that drastically underestimated the economic feasibility of the waterway and deadlocked the benefit/cost ratio at an anemic 1 to 1. Specifically, Settle reports, the Corps in 1955 was using the 1949 estimate of \$40 million in annual benefits, rather than the 1955 estimate of \$73 million benefits — which could have raised the benefit/cost ratio to a healthy 1.5 to 1.0.<sup>10</sup>



**Laying out great waterway plans were (left to right) Wayne Ferguson, Jim McCoy, Ira Krawitz, and Karl N. Reid.**

**1965: At the dedication of Eufaula Dam, Lady Bird Johnson stole the show from Lyndon when she told the crowd: "Bob Kerr has sat in my kitchen so many times and talked about the Arkansas River, I know the project by heart." Below: W. L. Boland, left, and Col. John W. Morris, right, welcomed President Johnson to Eufaula.**



Politics &

### **A FRENZY OF FAITH**

would carry the day, however. Supporters pulled together a fast and delicate strategy, including a bold threat by Newt Graham to veto, if necessary, six years of work by the multi-state and multi-agency AWRBIAC (Arkansas-White-Red Basins Interagency Committee) that was chaired by the Corps.

Col. Francis J. Wilson (by then retired from the Corps and Graham's engineering consultant) persuaded the Chief of Engineers to direct Washington's Eric Bottoms, who had led the waterway's earlier economic study for the Corps' Board of Rivers and Harbors, to review its feasibility again.

The strategy worked on multiple fronts. Tulsa Congressman Page Belcher, a Republican, had been an important friend to the Republican Eisenhower administration, and Belcher wrote the President asking for help with the Bureau of the Budget.

"If this doesn't get through," Belcher reportedly told the President, "there'll be a Democrat up here from my district next year."<sup>11</sup>

It was sometime later that Belcher heard from Eisenhower's representative that the Bureau had agreed to an appropriation the following year. "We will just throw the towel in and they can just go along with the Arkansas River," Belcher was told.<sup>12</sup>

Spring 1955: the Corps agreed to reinstate the project to active status and to recommend construction of those elements that were individually and economically justified, but the announcement of that decision was mysteriously misplaced. Newt Graham vowed to “blast loose” the report, and Kerr was notified on April 26, 1955, that the total project was again active. Exactly what actions Kerr had taken are not known, but Graham wrote to thank him “for restoring the Arkansas to the living.”<sup>13</sup>

By 1957 — the year that Sputnik propelled the U.S. into a frenzy of faith in technology over all odds — Gen. Itschner, the waterway opponent and by this time Chief of Engineers, had relented and promised Kerr that he would push the project as fast as possible.<sup>14</sup>

In the Eric Bottoms’ restudy, the benefit-to-cost ratio had come up to a respectable 1.2 to 1.0. The Chief of Engineers recommended that bank stabilization begin immediately and that work proceed on the first of three principal upstream dams — the Oologah Dam on the Verdigris northeast of Tulsa.

Opposition swelled

## **AGAINST THE OOLOGAH**

project, which one critic charged “was conceived in iniquity and born in sin.” Those opposed argued that the lake would flood productive farmland and oilfields.

Worst of all, they said, it would flood the birthplace of Claremore humorist Will Rogers. This was inadvertent poetic justice, because it was Rogers who contended in the '30s it would be cheaper to pave the Arkansas River than to build the waterway.

The on-again, off-again construction of Oologah Dam spanned 1950 to 1951, 1955 to 1963, and 1967 to 1974, reflecting in part whether opponents or proponents were in political power. It was, said reporter Joe Howell, the “acid test” of navigation support. Some observers blamed Oologah when, in 1950, opponent Mike Monroney defeated Oklahoma’s powerful Senator Elmer Thomas — although Thomas, in fact, had other political problems and wavered in his own support of Oologah.<sup>15</sup>

As late as 1954 Mike Monroney was arguing that the Oologah was undesirable and unnecessary for flood control. But Monroney swung to the side of support in 1955 when the City of Tulsa agreed — after a six-year campaign by Tulsa’s Chamber of Commerce — to buy water supply storage in Oologah Lake.

Kerr, meanwhile, was well on his way to earning his title of “uncrowned king of the Senate.”<sup>16</sup> He had an iron grip on power in Washington as chairman of the flood control subcommittee of the Senate Public Works Committee, which he also later chaired. He was in a key position to react strongly to President Eisenhower’s budget-cutting “no new starts policy” and to the President’s proposed 1956 budget that included no funds for Oologah, Keystone, or Eufaula Dams. These three upstream dams were key to the navigation project, but the Chief of Engineers was holding up funds until engineering problems with the silt were resolved.<sup>17</sup>

Kerr traded his vote for the new \$27.5 billion federal interstate program in exchange for waterway support, and Congress reinstated funds for the dams — although they were still opposed by the Bureau of the Budget and on the Corps’ inactive list.

It was the decisive moment.

“Further questions by the Chief of Engineers on engineering and costs were useless,” the Corps’ official Southwestern Division history reports. “Congress had declared its intention to build the waterway, and the Corps of Engineers had to comply.”<sup>18</sup>



**Will Rogers’ home was moved out of the Oologah Lake area.**

**I was born in my father’s ranch house halfway between Claremore and Oologah. I usually say I was born in Claremore for convenience, because nobody but an Indian can pronounce Oologah.**

**— Will Rogers**



Photo courtesy Hopkins Photography



## Chapter 4 RENAISSANCE OF A RIVER

**“D**on’t let anybody tell you that the basic engineering for this project has been worked out.”

With those words from the Corps’ engineers still fresh in his memory, Brig. Gen. William Whipple, Jr., arrived in Tulsa as Southwestern Division commander. His number one job was to expedite waterway construction, to solve problems he had declared unsolvable.

It was 1958, a year since the navigation system’s construction had begun, and ironically the year that Newt Graham died.

Whipple hit what he called a “formidable wall of unsolved technical problems. This may be one of the most complicated projects the Corps of Engineers has ever undertaken.”<sup>1</sup>

He had, in fact, opposed the project throughout his career in the Corps’ Washington office.

“I was one of the group that put the Arkansas navigation project on the shelf some years ago,” he conceded to the Tulsa Chamber of Commerce in 1958. “Now [that] the Congress has decided on its construction, there is to be no further discussion or delay. My mission is to build the project just as well and as rapidly as I can. You can count on me for that.”<sup>2</sup>

Whipple had been sent to the Southwestern Division because of his knowledge of sediments, and he was determined to find a solution to the sediment problem. He hired three consultants and organized them as the Arkansas River Sediment Board. One of them, who followed the project throughout its construction, was Prof. Hans Albert Einstein, son of the famed scientist Albert Einstein. Prof. Einstein, according to one observer, wanted to specialize in something more challenging than his father’s work — so he devoted his life to studying sediment.

This sediment group’s objective was to get control of the meandering river and let it cleanse itself. In essence, major reaches of the river would be deepened, straightened, and narrowed down by the judicious placement of rocks and timbers, thus stabilizing banks and making the river flow faster. They hoped the faster waters would flush out sediments that otherwise would settle, shoal, and require constant dredging.

The plan was tested by the Waterways Experiments Station at Vicksburg. Not only did it work, but \$31 million could be saved by cutting out four upstream sediment-trap dams.

It would be sometime later, well into construction, before Whipple could write with “a profound sense of relief that this great project, unprecedented in character, is adhering to the early estimates and even indicating the possibility of savings.”<sup>3</sup>

It was like

### **RACING AGAINST THE CLOCK,**

and in one man’s opinion, building the waterway became more a matter of economics than engineering. That was how Whipple’s replacement, Maj. General Robert J. Fleming, put it.

“Nuts,” he told the Arkansas Basin Development Association in November 1960. “If you give us the money, we will expedite the program and could finish it in 1967.”

Kerr took that as a challenge and after some negotiations agreed to a 1970 completion date. He not only promised to obtain funding, he delivered so well that, at times, funding exceeded the Corps’ capability to use it.<sup>4</sup> The combination of Kerr and President Kennedy proved powerful; “What Kerr wants Kennedy gets,” observers said.<sup>5</sup>

Now the race against the clock was underway. In April 1961 the Tulsa District was given responsibility for planning and designing all locks and dams except the Dardanelle in Arkansas. The Tulsa District established a new Design Branch in its Engineering Division and recruited engineers from around the nation.

The construction schedule was sacrosanct, with the Tulsa District responsible for building all locks and dams in Oklahoma and the Little Rock District handling those in Arkansas. Military work was shifted from the Tulsa District, in recognition of its heavy civil workload that sometimes



Photo by Mel Roca

**1988: Barging ahead on the Arkansas River Navigation System, this photo shows the largest tow ever on the waterway, shown here by the Highway 51 bridge.**

**Far left: 1956 ground breaking for Keystone Dam were, left to right: Cleo Engle, Col. Wilson, Col. Bristor, Gov. Raymond Gary, Sen. Bob Kerr, Rep. Page Belcher, and Gary Vandever.**

included non-waterway civil workloads even heavier than the waterway.<sup>6</sup>

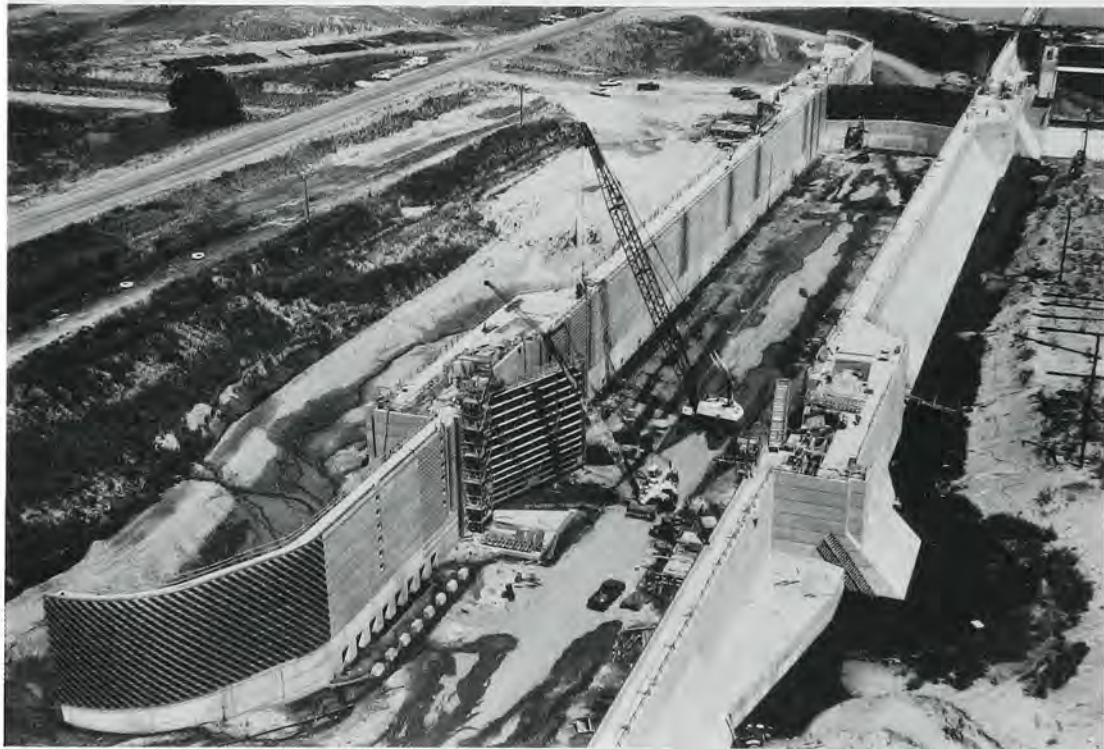
To keep all elements on track, the Corps instituted the new Critical Path Method of planning and scheduling. Giant CPM charts showed all the tasks necessary to complete the project and the interrelationships among them: research, design and engineering, bidding and contracting, along with all the other jobs that must be completed.

After Senator Kerr died unexpectedly in 1963, Oklahoma Congressman Ed Edmondson and Arkansas Senator McClellan took over in obtaining congressional appropriations, using CPM schedules to show colleagues the importance of timely funding for the projects.

Two major challenges were land acquisition and relocations of public services such as roads, railroads, and utilities.

The relocations work was of major scope and those for Oologah, Keystone, and Eufaula had to be performed simultaneously. Road relocations alone totaled \$55 million; all told, relocations for the three projects — not including any land acquisition costs — totaled more than \$100 million, more than one-third of the three projects' costs.

In 1958, Col. Bristor named A.B. Bastos his special assistant in charge of relocations and David Helms chief of the Real Estate Division. A number of significant policies were worked out in the Tulsa District during those years that later became models for federal laws relating to relocations and land acquisition.<sup>7</sup>



**1969: Arkansas River Waterway construction was underway at W.D. Mayo Lock and Dam 14 near Fort Smith (top photo) and at Newt Graham Lock and Dam near Tulsa. Lower right, Webbers Falls Lock and Dam contained a massive debris buildup during the 1986 flood.**



## PINKEY'S PLIGHT



**Left, Col. Pinkey. Right, Jack Crawford, now building boomerangs as a retirement hobby.**



Photo courtesy of Tulsa World

**T**he statement is flat-out and absolute in the official history of the Tulsa District's waterway construction by Dr. Settle:

*"No other Tulsa DE [District Engineer] has ever had a challenge of the dimensions of the one Col. Vernon W. Pinkey had during his more than three years in the District."*

*According to Settle, the challenge came as a surprise when Pinkey arrived in the District in the spring of 1968 and discovered that the waterway had to be operating in 1970.*

*"Pinkey's Plight," as wags termed it, revolved around limitations on disbursement of funds. To meet the schedule, he had to resolve a series of interlocking problems, including negotiations for four major railroad bridge relocations. And he had to instill the required sense of urgency throughout the organization.*

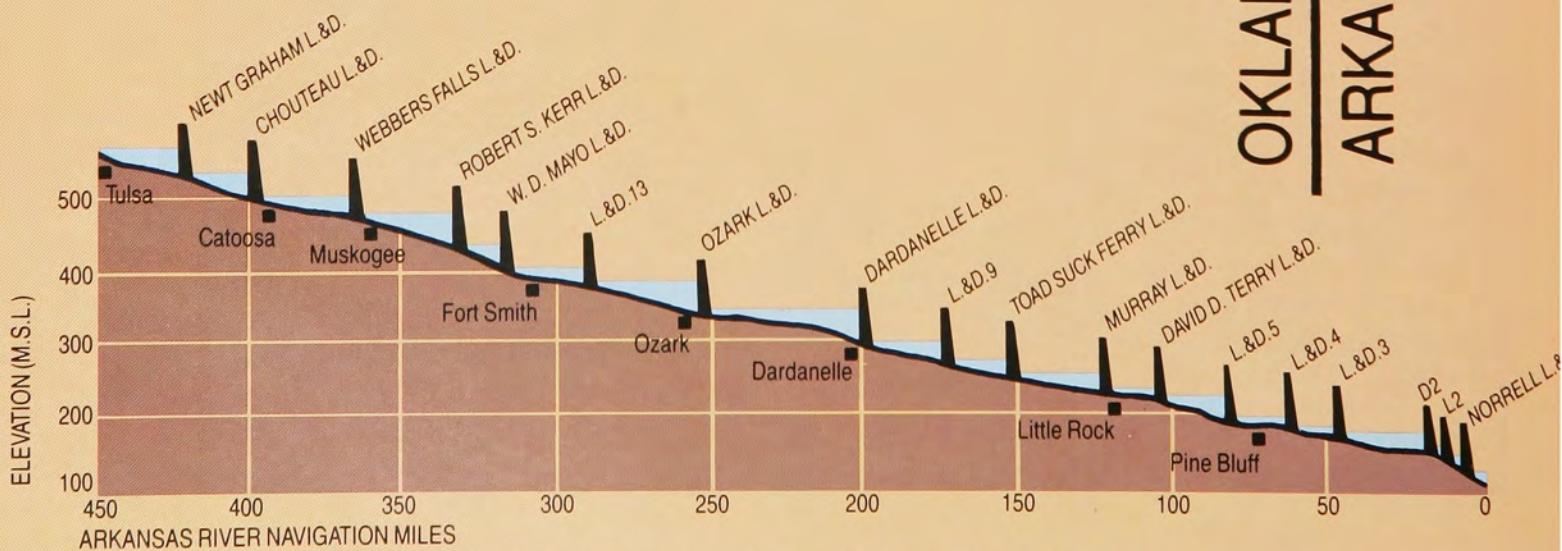
*One key step: Pinkey appointed Jack L. Crawford as coordinator for all the Oklahoma parts of the navigation project and gave him authority to get the job done.*

*"On Dec. 30, 1970, at Lock and Dam 18, the Corps of Engineers workboat Sallisaw and survey boat Arkoma locked through, signifying the official opening of the lock for navigation," Settle reported. The next day Pinkey notified the Chief of Engineers:*

*"Mission accomplished. Arkansas-Verdigris River System declared open for navigation at Catoosa on 31 December 1970. Included in party on inspection trip this date were Gov. Dewey Bartlett, Congressman Ed Edmondson, and local dignitaries. Details follow. Happy New Year."*

*Then Chief of Engineers Lt. Gen. F.J. Clarke wired back his congratulations to the entire Tulsa District:*

*"This schedule . . . has required unprecedented effort on part of the Corps, its contractors, as well as local interests, the Congress, and three presidential administrations. The engineering achievement is monumental and will continue for years to come to be used as an outstanding example of what can be done to meet a national challenge."<sup>8</sup>*



**MCClellan-Kerr System—Locks, Dams, Navigation Pools**



*The McClellan-Kerr Arkansas River Navigation System: a 445-mile-long water stairway that rises 420 feet from the Mississippi River to Catoosa. Left, locking through Kerr Lock and Dam.*

## **Arkansas River Basin Arkansas and Oklahoma**



## THEY'RE TALKING ABOUT US: "Oil and Water Will Mix"

**"S**naking northwestward from the Mississippi River," wrote the St. Louis Post Dispatch in April 14, 1974, "the Arkansas River Waterway . . . has resulted in the greening of Tulsa, now a livelier port than St. Louis. This major American inland waterway (once called) the 'boondoggle,' is becoming an economic 'boon' to Arkansas and Oklahoma."

The Post-Dispatch review of the waterway was among dozens that have appeared in national and international publications ranging from National Geographic to a trade sheet called Traffic World.

"The eastern part of Oklahoma," said Time Magazine, "has been transformed from dusty scrub land into an aquatic paradise.

"Its 679 square miles of water make its ratio of water to land higher than Minnesota's . . ."

"A land with plenty of room and abundant resources is opening up here in middle America," wrote U.S. News and World Report.

"A seaport in the plains?" asked Shreveport Magazine, which called the waterway "one of the most ambitious and

controversial public-works projects in U.S. history (and) probably the most expensive waterway built anywhere . . . four times the cost of the Panama Canal." It was predicted to return \$1.15 for every \$1 spent.

The Port of Catoosa, said the Shreveport Magazine article, "will link the Arkansas River with some 25,000 miles of inland and coastal waterways from the Great Lakes to the Gulf of Mexico . . . as well as foreign ports as far away as Japan

.. By turning the once-wild Arkansas into a placid waterway, it will open for development the rich resources of the so-called Arkansas Basin, up to now the only major region in this country without water navigation. What a storehouse of wealth is here."<sup>9</sup>

"This is truly an instance," wrote a trade publication called Handling and Shipping, "when oil and water will mix."<sup>10</sup>

And, concluded the Tulsa World on June 29, 1969, "Those who said it couldn't be done probably are the same ones who are saying nobody will ever walk on the moon."



**1971: The Tulsa-Rogers County Port of Catoosa, at the head of navigation, was dedicated by President Nixon and Oklahoma Gov. David Hall. Anita Bryant sang "America the Beautiful."**

## LYNDON JOHNSON AND THE WATERWAY

**W**ith the Vietnam War haunting him in 1964, President Lyndon Johnson ordered a freeze on new civil works construction starts and proposed cutting \$14 million from Tulsa District waterway funds.

The reaction from Oklahoma and Arkansas was sure and swift. The loss would set back the waterway project five years and cost \$40 to \$50 million, argued a high-powered delegation of six senators and six representatives who met with Johnson on July 29, 1964.

The President listened for 30 minutes and questioned each visitor individually, they later recalled. Then he reached under the blotter pad on his desk and pulled out a paper.

"John," he said to Senator McClellan, a member of the Senate Appropriations Committee, "you've convinced me. I have

something here for the committee. Should I send it down or do you want to take it?"

"What is it?" McClellan asked.

"A request for additional money."

"I'll take it down."

On Sept. 25 of that year, Lyndon Johnson gave the principal address when Eufaula Dam was dedicated. He recalled that he had begun the year with "a prudent budget."

"And," the President said with a gleam in his eye, "I was determined to keep it that way until Mike Monroney, Carl Albert, John McClellan, and all this bunch of hijackers from Oklahoma came . . . and it cost me \$14 million, but I got your Arkansas River back on schedule . . ."

"As President, I am here to promise you that it will go on schedule."<sup>11</sup>



**Left, visitors view Eufaula Dam the day before its 1964 dedication, which drew President Lyndon Johnson to Oklahoma. Eufaula was a key element in the navigation system.**



***Top photo: Mayo Lock and Dam. Bottom: Kerr Lock and Dam.***





**Top photo: Chouteau Lock and Dam. Bottom, Newt Graham Lock and Dam.**

## **AN OKAY ANCHOR**

**W**aterway construction workers excavating the Verdigris River near Okay, Oklahoma, were surprised in November 1970 when a dragline fished out a two-ton “something.”

Whatever it was, it was old, rusty, and big: easily 10 feet long and 6 feet wide. It had a central shank that flared out on the lower end into metal wings that made it look like — well, like an anchor.

The construction boss said if he didn’t know better, he would speculate that it was an ancient anchor lost from some

sea-faring vessel. But this was the Verdigris, not the Mississippi.

It took Dr. William Settle, Jr., then chairman of the University of Tulsa history department and later author of the official Tulsa District Corps’ history, to set the record straight.

Navigation had indeed been a part of the Verdigris River’s past, Settle said. He speculated that the anchor dropped from a large barge or other vessel navigating the river more than 100 years earlier.<sup>12</sup>

## **MILESTONES ON THE WAY TO BUILDING A WATERWAY**

*1800s: Indians, French explorers, traders, military suppliers, and shippers used the Arkansas River for water transportation in various small boats and steamboats.*

*1907: Interest in navigation was rekindled around the time of Oklahoma statehood and smoldered for decades in various community booster groups.*

*1920: Newt Graham appointed to Tulsa Chamber Waterways Committee and became an avid booster for Arkansas River navigation.*

*1943: Arkansas River flood disasters focused attention of Oklahoma*

*Gov. Bob Kerr on water resources development. Corps developed a multipurpose plan for the river and its tributaries.*

*1946: River and Harbor Act authorized the multipurpose plan, including Arkansas River navigation.*

*1950: Construction started on Oologah Reservoir, then stopped because of the Korean conflict.*

*1954: The navigation project was classified as inactive, then restudied.*

*1955: The navigation project was revised and reclassified to active status.*



***Work was progressing in 1965 on Webbers Falls Lock and Dam.***

1956: Work resumed on Oologah and began on Keystone and Eufaula Reservoirs.

1957: Construction started on the Dardanelle Reservoir.

1963: Construction started on Lock & Dam 1 and Arkansas Post Canal. The first stage of the Oologah was completed.

1964: Construction started on the Ozark Lock & Dam, Robert S. Kerr Lock & Dam; and Locks & Dams 2, 3, and 4. Keystone was completed.

1965: Construction started on Webbers Falls Lock & Dam and on Locks & Dams 5, 6, 7, and 8.

1966: Construction started on Locks & Dams 9, 13, and 14.

1967: Construction started on Locks & Dams 17 and 18.

1968: Navigation opened to Little Rock.

1969: Navigation opened to Fort Smith.

1970: Navigation project was fully operational to Port of Catoosa near Tulsa.



**Webbers Falls Lock and Dam is built in the historic Three Forks area, near left. The first bucket of cement was poured at Kerr Lock and Dam in 1966, under supervision of Robert D. Patterson and W.L. Boland.**

## ARKANSAS RIVER WATERWAY: BOON OR BOONDOGGLE?



*Has the waterway delivered on its early promises? By 1989, data began to reveal some longer-term trends and some succinct answers:*

- Has the waterway turned the Arkansas Valley into heaven on earth? No.*



## McCLELLAN - KERR ARKANSAS RIVER NAVIGATION SYSTEM

### DEDICATION 5 JUNE 1971



PREPARED BY  
U. S. ARMY ENGINEER DISTRICT, TULSA



#### DEDICATION OF THE McCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM June 5, 1971

**9:00 a.m.**  
Creek Nation Pipes and Drums  
The Young Tulsans  
Jerris Linnens, director  
University of Tulsa Modern Choir  
Arthur Henswood, director  
Strategic Air Command Band  
Orion Air Force Band  
Major James Roland, director  
Announcements  
Vic Batten, president  
Tulsa Press Club

**10:45 a.m.**  
Al Hirt

**11:15 a.m.**  
**Welcome**  
F. G. McClintock  
Master of Ceremonies

**11:30 a.m.**  
**Presentation of Colors**  
**The National Anthem**  
Anita Bryant

**Invocation**  
Dr. William J. Wiseman  
First Presbyterian Church, Tulsa

**Introductions**  
F. G. McClintock

**Brief Remarks**  
The Honorable John M. Love  
Governor of Colorado  
The Honorable Dale Bumpers  
Governor of Arkansas

**Presentation of Commemorative Coins to**  
The Honorable John L. McClellan and Robert S. Kerr, Jr.  
Kenneth W. Rugh

**12:00 Noon**  
**Introduction of Presidential Guests**  
"America the Beautiful"  
Anita Bryant

**Blessing of the Waterway**  
The Very Reverend Victor J. Reed  
Bishop, Diocese of Oklahoma City and Tulsa

**Welcome**  
The Honorable David Hall  
Governor of Oklahoma

**Unveiling of the Dedication Plaque**  
**Principal Address**  
THE PRESIDENT OF THE UNITED STATES  
RICHARD NIXON

**1:30 p.m.**  
Strategic Air Command Band  
The Young Tulsans

**1:45 p.m.**  
Democratization Air Sea Rescue  
United States Coast Guard  
Sky Diving  
Vic Batten, Don Boyer  
Guane Decker

*Al Hirt (top photo) entertained the patriotic throng who gathered at the 1971 waterway dedication. Among a half dozen bands and choirs who performed was the Creek Nation Pipes and Drums.*



- Has it already paid for its initial cost in multipurpose benefits — such as flood control, recreation, power — as well as navigation? Yes.*
- Has it paid for its initial cost in navigation traffic alone? Not yet.*
- Has it helped equalize competition among railway and other modes of transportation in the region, thereby improving regional commerce? Probably.*
- Has it produced a sustained economic boom in the region, developing an economy strong enough to withstand downturns like the 1980s oil bust? Yes and no, in that order.*
- Has it improved, overall, the life of the region's citizens? Absolutely.*
- Has it been tapped for its full potential as a long-term economic resource? Absolutely not.*

*Looking for the bottom line on the waterway's bang for its bucks, John Sparlin, Tulsa District 25-year-veteran chief economist, has analyzed the system from just about every perspective.<sup>13</sup>*

*Any objective analysis of the waterway's cost effectiveness, Sparlin says, must begin with its total cost: \$1.2 billion for the total system, Catoosa to the Mississippi River, including about \$450 million for the upper, Tulsa District portion in Oklahoma.*

*Those initial costs are dwarfed by the total cargo shipped along the waterway — steel, wheat, fertilizer, fuel oil, glass sand, manufactured products, and a wide variety of other freight. Since it began operating, 142 million tons of cargo have been shipped on the Arkansas River waterway — including 50 million tons*

*shipped on the Tulsa District part. At an average value of, say, \$500 per ton, that's about \$25 billion dollars of cargo shipped in the District, and more than \$70 billion dollars on the entire waterway.<sup>14</sup>*

*The Port of Catoosa alone — one of five major public ports and 25 private ports along the system — has logged more than 20 million tons of cargo shipped on 14,000 barges. (A rule of thumb: one barge carries the equivalent of about 60 semi-trucks or 15 railroad cars.)<sup>15</sup>*

*Did those shippers save money by using the waterway? It's impossible to say positively, says John Sparlin.*

*"But," he adds, "if dollar savings were as little as \$1.50 a ton — and that would be a very conservative estimate — they would have saved \$75 million in the Oklahoma portion of the waterway, and about \$213 million along its total length. You could call that estimate the direct navigation benefits produced thus far on the waterway."*

*The picture is brighter in flood control. The waterway paid for itself in flood control benefits alone by December 1987, when the Corps estimated waterway projects had already prevented \$1.3 billion in flood damages throughout its length, including \$536 million on just the Oklahoma portion.*

*Even more difficult to quantify are the spin-off economic benefits that produce the real changes in the region. And still untapped is the future potential for military use, just beginning to be explored, along with other civilian uses.*

*"The potential of the McClellan-Kerr as a long-term economic resource to this region is virtually untouched," Sparlin says. "Leaders are just beginning to recognize its international trade potential, for example."*

*In the life of the McClellan-Kerr Arkansas River Navigation System, the best is yet to be.*



**Top left, Col. Bening wraps up a waterway inspection tour in 1979. Bottom photo: a 1988 inspection crew included (left to right) State Rep. Grover R. Campbell, Col. Patete, State Rep. Warren Green, and Tulsa District Operations Division Chief J. Pat Clark.**

### **LAFORTUNE'S REFLECTION**

*“The impact is tremendous when you actually see the barge coming and tying up, and see the goods being unloaded as we did that day.*

*“It is, indeed, a realization that we have completed a tremendous new transportation link . . . a link that literally*

*serves as a bridge to a whole new era of commerce previously unknown to us.”*

— Robert J. LaFortune, Mayor of the City of Tulsa, 1971 — a reflection after the first barge docked at Tulsa’s port<sup>16</sup>



***In 1986, the Frauke (top photo) became the first ocean-going vessel to travel the waterway. Bottom photo shows the first tow that traveled the entire waterway.***

The end came

## **JUST UNDER THE WIRE.**

In some instances federal policies were tested in Tulsa during those years. One example is a Corps program, new in 1964, called “value engineering” that provides financial incentives to workers or contractors who come up with more economical ways to perform jobs. Col. John Morris, reviewing the new federal policy that stressed value engineering, decided to put it to work. The result: the first significant value engineering breakthroughs, Corps-wide, occurred in the Tulsa District, which saved more than \$7 million by the end of 1971.

Construction progressed rapidly. Oologah Dam was completed in 1963, Eufaula and Keystone in 1964, and the others soon followed. The waterway was ready to use on Dec. 30, 1970 — just under the wire of the promised 1970 opening date.

Three weeks later, on Jan. 21, 1971, the first freight barge landed at Catoosa, carrying 650 tons of newsprint. At last the Arkansas was navigable.

It was sometime later, in one of many studies of the waterway’s impact on the valley region, that the University of Missouri’s Department of Sociology concluded the project had changed the lives of residents forever.

“The composition of the population is changing in favor of higher educational, occupational, and income levels as migrants move to the area,” the researchers concluded. “This has resulted in greater economic diversity, availability of labor, and in many cases, improved roads, etc. . . .”<sup>17</sup>

“The fickle Arkansas,” wrote the editor of the *Arkansas Gazette*, “which scourged the countryside with floods and shrank to a trickle in seasons of drought, now runs in bank for the year round, controlled by locks and dams that open up navigation back into what used to be Indian country and lace the great valley with clear lakes. The quality of life has visibly improved.”<sup>18</sup>

. . . There lies the port;  
the vessel puffs her sail;  
There gloom the dark,  
broad seas.  
My mariners,  
Souls that have toiled,  
and wrought, and thought  
with me —  
That ever with a frolic  
welcome took  
The thunder and the  
sunshine, and supposed  
Free hearts, free  
foreheads — you and I  
are old . . .

The lights begin to  
twinkle from the rocks;  
The long day wanes; the  
slow moon climbs; the  
deep  
Moans round with many  
voices . . .

— Alfred, Lord Tennyson



**SECTION 5:**  
**CIVIL WORKS TRENDS**

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## Chapter 1 DAMMED IF WE DO

*“ . . . I am too long away from water.  
I have a need of water near.”*

— Edna St. Vincent Millay

**T**he story of the Tulsa District's big dam program, with its companion smaller civil works projects, would fill a bookshelf and here can be traced only in silhouette.

A storyteller might well begin the tale of the lakes in the middle, the middle 1960s, at the time of the Tulsa District's 25th birthday.

The Tulsa District's civil works construction program was at its zenith. It was, in fact, number one in the nation, as attested by 1,400 employees working on 101 projects. These ranged in scope from a \$1000 study to the \$1.2-billion navigation project, the largest civil works project in Corps' history. The \$100-million workload in 1964 ranged in stages from planning through construction to operations.<sup>1</sup>

“A new era is dawning in the Southwest as its water resources are being developed,” said Col. John W. Morris, Tulsa District Engineer, on the District's silver anniversary, July 1, 1964.

From that center point, Morris looked backward, then forward.

In its first 25 years (disregarding for the moment its military work), the Tulsa District had completed a dozen multipurpose reservoirs — providing flood control, water supply, hydropower, and recreation for millions. Eleven more impounded lakes were under construction; a dozen more were under design, along with four locks and dams. Comprehensive river basin studies and smaller projects were also underway.

Indeed, as great as was the workload on the waterway, the District's other civil works outdistanced it, and the benefits were mounting. Sixteen million people visited the reservoirs that year. And already the projects had prevented an estimated \$132 million in flood damages.

Over the coming 25 years, even more profound changes would occur that would reshape the economy of the region and touch the lives of all its citizens. “The Corps of Engineers stands ready, anxious, and a bit impatient, to get on with the tasks at hand,” Morris said.

As he looked into the future, he recalled Robert Browning's words:

*“Grow old along with me,  
The best is yet to be . . .”*<sup>2</sup>



**Col. Morris**

**Below, Col. Pinkey stakes out a claim for wildlife preservation.**

**Right, record 1986 rainstorms pressed Keystone Dam flood gates into full-tilt operation.**



It was

## **A FULL PLATE**

of reservoir work for the Tulsa District from day one, July 1, 1939. The District had an edge, starting off, in several important areas.

The new District also inherited two projects — Great Salt Plains and Fort Supply — under construction by the Little Rock District.

Another early job, one of the most cost-effective in District history, was constructing levees along the Arkansas River through the City of Tulsa. This \$3 million project was completed during World War II and would prevent more than \$250 million in flood damages over the next 42 years.

From the outset

## **THE LUCK OF THE DRAW**

was with the Tulsa District, and the hands dealt were fortunate in many ways

- The place was ripe and rich — ripe for water resources development and rich in resources. Its needs were obvious, its opportunities overwhelming.
- And it was right. The plans were right. The program was laid out early with sound yet visionary plans, the far-reaching effects of which would have frightened more timid planners.
- The leadership was right. Over the long term, the region generated the political will and muscle to carry out those plans, despite the odds and entrenched opposition.
- The local politics were, momentarily, right. When the historic 1936 flood control act was passed, Oklahoma was ready, thanks to Oklahoma Gov. E.W. Marland, an advocate of water resources projects. Only two states, Oklahoma and Pennsylvania, had approved legislation





AC  
TRACTORS  
FRED E. COOPER



***Local protection projects such as the Jenks levee (shown here with the city of Tulsa in the upper right background) and the Sand Creek project in Newton, Kansas (inset photo), are among the District's most cost-effective flood control works.***



that allowed them to capture the new federal funds. The state law allowed Oklahoma to buy land to be flooded and to operate and maintain projects after construction. As a result, the 1936 act authorized four projects — Great Salt Plains, Fort Supply, Hulah, and Optima — and the Legislature authorized \$100,000 so Don McBride, then in the state water office, could buy land for Fort Supply and Great Salt Plains.<sup>3</sup>

- The timing was right. The Tulsa District was formed in response to a new federal policy to control flooding through big upstream dams, in an era and region in which dusty mouths craved water. In the Depression and again with the upswing of activity that came after World War II, the nation was looking to water resources development to stabilize employment.
- And luck was right, more often than not. The element of chance — simply the luck of the draw, perhaps — often fell on the side of water resource development. How else could one explain the uncanny tendency for there to be, as journalist Joe Howell called it, over and over “the right man at the right time”?<sup>5</sup>

### **“TULSA DISTRICT ENGINEERS INVOLVED IN 101 PROJECTS — A \$100 Million Team Effort.”**

*“Tucked away in the upper reaches of a Tulsa office building, in construction shacks, or making field studies in pertinent sections of a seven-state area are the men and women of the Tulsa District Army Corps of Engineers,” wrote a Wichita Eagle reporter in 1966.*

*“In the office or on the project site, it’s difficult to distinguish between corps personnel and others involved in these many developments.*

*“Yet when you can find one with a few minutes time to spare, it’s quickly discernible that he considers himself simply a part of the ‘team effort.’*

*“During the coming 12 months, the Tulsa District . . . will supervise the spending of some \$100 million in project efforts . . . .*

*“The Tulsa District (under direction of Col. George A. Rehb as district engineer) has approximately 1,400 federal civil service employees.*

*“Other Army officers rounding out the military complement are deputy district engineer Lt. Col. David K. Craig, Tulsa; and Maj. Elbert W. Link, resident engineer on the Pine Creek project near Valliant, Okla.*

*“Concerned solely with civil works projects, the Tulsa District presently is*

*involved in 101 projects ranging from reconnaissance phase through planning, construction and operational stages.*

*“Col. Rehb said his District is operating 18 completed dam and reservoir projects, of which four produce hydroelectric power.*

*“An additional 14 local protection projects are under supervision of the District, such as the Wichita-Valley Center Flood Control Project.*

*“Rehb said total capital investment in recreational facilities, excluding land costs, at the 18 sites is in excess of \$11 million.*

*“Citing the growing use of recreational facilities at the locations, Rehb noted that more than 22.5 million visits to the reservoirs were recorded last year, involving an operation-maintenance cost of approximately \$1.5 million.*

*“The bulk of the district’s financial efforts currently are directed to the Arkansas River navigation project — a \$1.2 billion undertaking.*

*“Sixteen major projects now under construction include locks and dams, along with bank stabilization on the Arkansas River at an outlay of \$682.7 million.”<sup>5</sup>*

The Corps

## **DAMMED AT**

**FULL SPEED AHEAD** over the past half century, and looking back, the years blur into waves of action:

- To the west, Great Salt Plains Lake was completed in 1941; Fort Supply Lake in 1942; Canton Lake — after a recess for World War II — in 1948. Meanwhile, Denison Dam impounded Lake Texoma in 1944. Fall River Lake in Kansas and Wister Lake in eastern Oklahoma were completed in 1949.
- In the cost-cutting 1950s, with the onset of the Korean conflict, only four projects were actually completed: Heyburn Lake south of Tulsa in 1950, Hulah Lake northwest of Bartlesville in 1951, and Fort Gibson and Tenkiller Ferry Lakes in eastern Oklahoma in 1953.

But ground was laid for dramatic movement during the 1960s, when a record dozen major lakes (plus five locks and dams) were completed:

- 1960: Toronto Lake in southern Kansas;
- 1963: Oologah Lake northeast of Tulsa;
- 1964: Keystone and Eufaula Lakes to Tulsa's west and south, plus John Redmond Reservoir and Council Grove Lake in southern Kansas;
- 1966: Elk City Lake in southern Kansas and Millwood Lake in southwest Arkansas;
- 1967: Pat Mayse Lake near Paris, Texas, and Marion Lake in central Kansas.

In southern Oklahoma, Broken Bow Lake was closed in 1968, as was Pine Creek Lake in 1969.

In the 1970s, 13 projects were completed. The decade opened with five navigation projects: Chouteau, Newt Graham, Kerr, Mayo, and Webbers Falls. In southeastern Oklahoma, Hugo Lake was completed in 1974. Others included Dierks and Gillham Lakes in southwest Arkansas in 1975; Birch Lake north of Tulsa, DeQueen Lake in southwest Arkansas, and Waurika Lake in southwest Oklahoma in 1977; and Optima Lake in the Oklahoma Panhandle in 1978.

The 1980s rounded out the reservoir completion schedule: in Kansas, Pearson-Skubitz Big Hill Lake and El Dorado Lake in 1981; Sardis Lake (earlier called Clayton Lake) in southeastern Oklahoma and Copan Lake north of Bartlesville in 1983; Skiatook Lake northwest of Tulsa in 1984; and Arcadia Lake, the last of the big reservoirs, in November of 1986.<sup>6</sup>



***In 1942, the Tulsa District completed Fort Supply dam on Wolf Creek (a tributary of the North Canadian River) in western Oklahoma. Named after Camp Supply, a frontier military post, Fort Supply is home to native prairie dogs.***

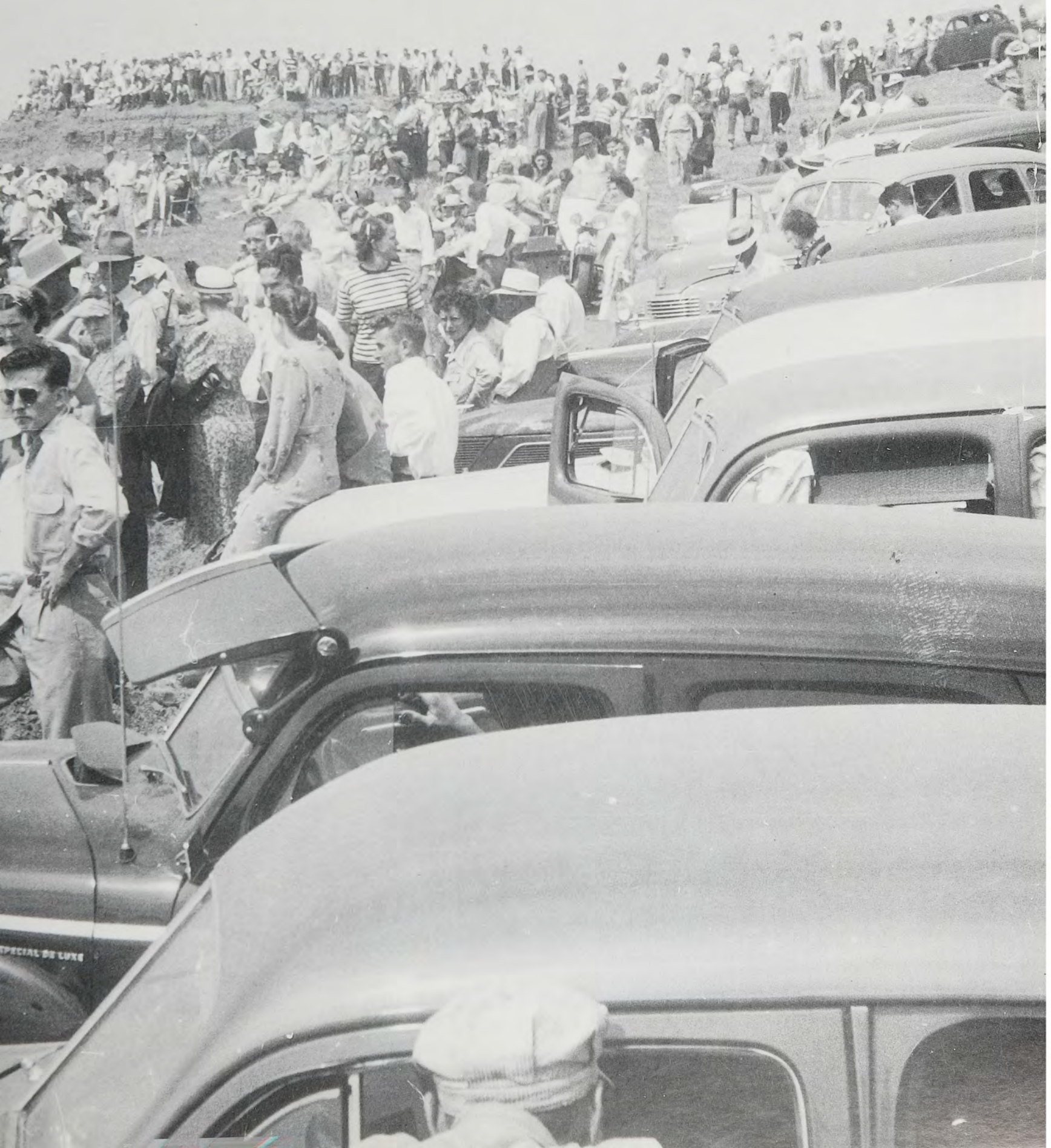
Seven lakes were completed in the 1940s.

Memorial Day, 1948: Crowds gathered at the District's oldest project for the annual Great Salt Plains Lake boat races, sponsored by the Northwest Oklahoma Sportsmen Association. The popular recreation area includes Great Salt Plains National Wildlife Refuge. Inset: A Fort Supply raccoon makes a good playmate.

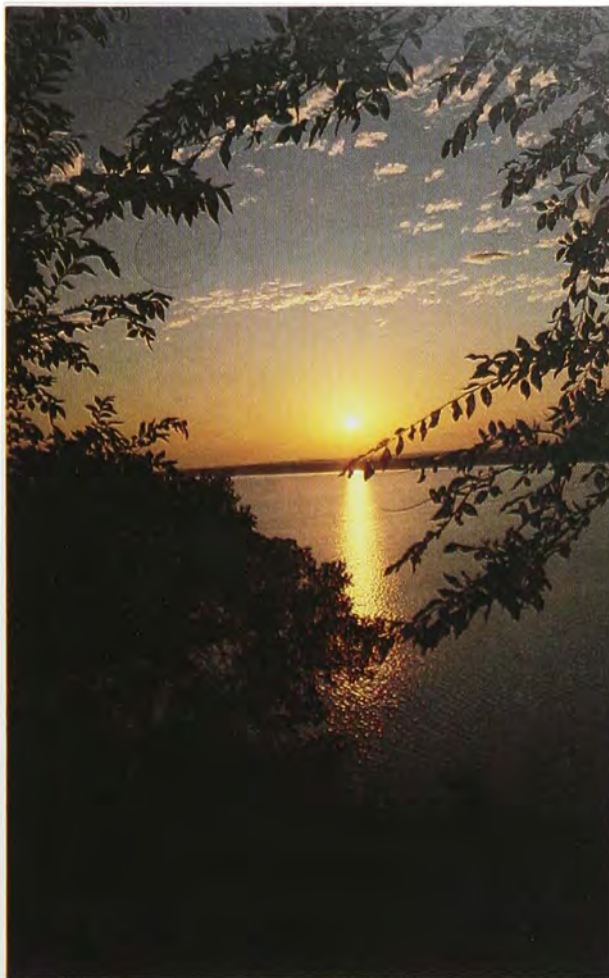


**Legend has it that Great Salt Plains Dam is built atop a buried treasure: 1,400 pounds of gold bullion supposedly stashed in 1845 by miners returning from California who were killed by Indians. For 40 years local resident Carl Joseph Shelton, like an Oklahoma Sisyphus, tried to wrest the treasure from mud and**

**quicksand. He claimed to have actually located the trunk at once point, but a crude buffalo-hide rig split and let the treasure slide back into the quicksand. Shelton greeted Corps' dam builders with his shotgun, convinced until he was led away that Great Salt Plains Dam was burying a treasure.**







**1944: Lake Texoma fishermen such as Lee Hogue were gleeful on opening day of fishing season, after the lake had been closed for a year. The largest lake in the Tulsa District, Texoma provides flood control and hydropower for the Red River valley. Upper left, snow highlights Texoma and (lower right) Canton Lake. Upper right, sunset at Canton, a popular hunting and fishing spot in the high plains of western Oklahoma.**

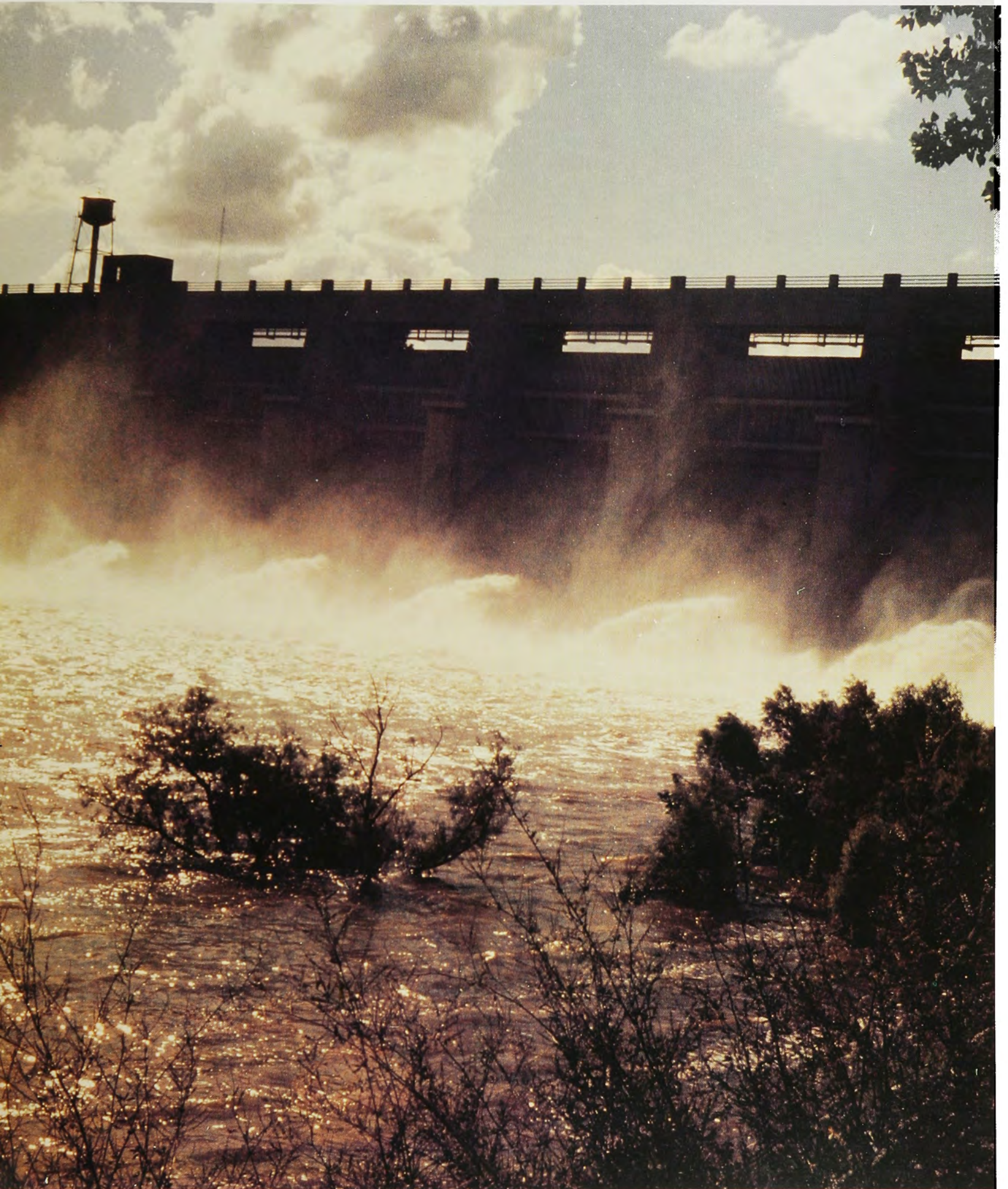
**The pleasantest angling is to see the fish cut with her golden oars the silver stream, and greedily devour the treacherous bait.**

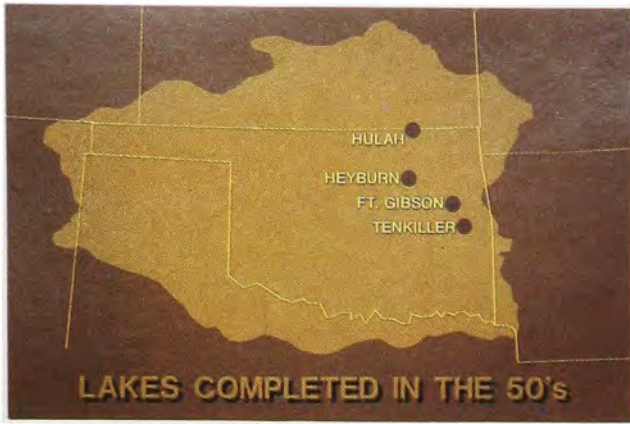
**— Shakespeare**





***Fall River Dam in Greenwood County, Kansas: upper left, under construction, 1947, and completed, right. Lower left: fishing is a delight at Wister Lake on the Poteau River in eastern Oklahoma. The scenic and historic Wister area has been inhabited for thousands of years and contains numerous archaeological treasures.***

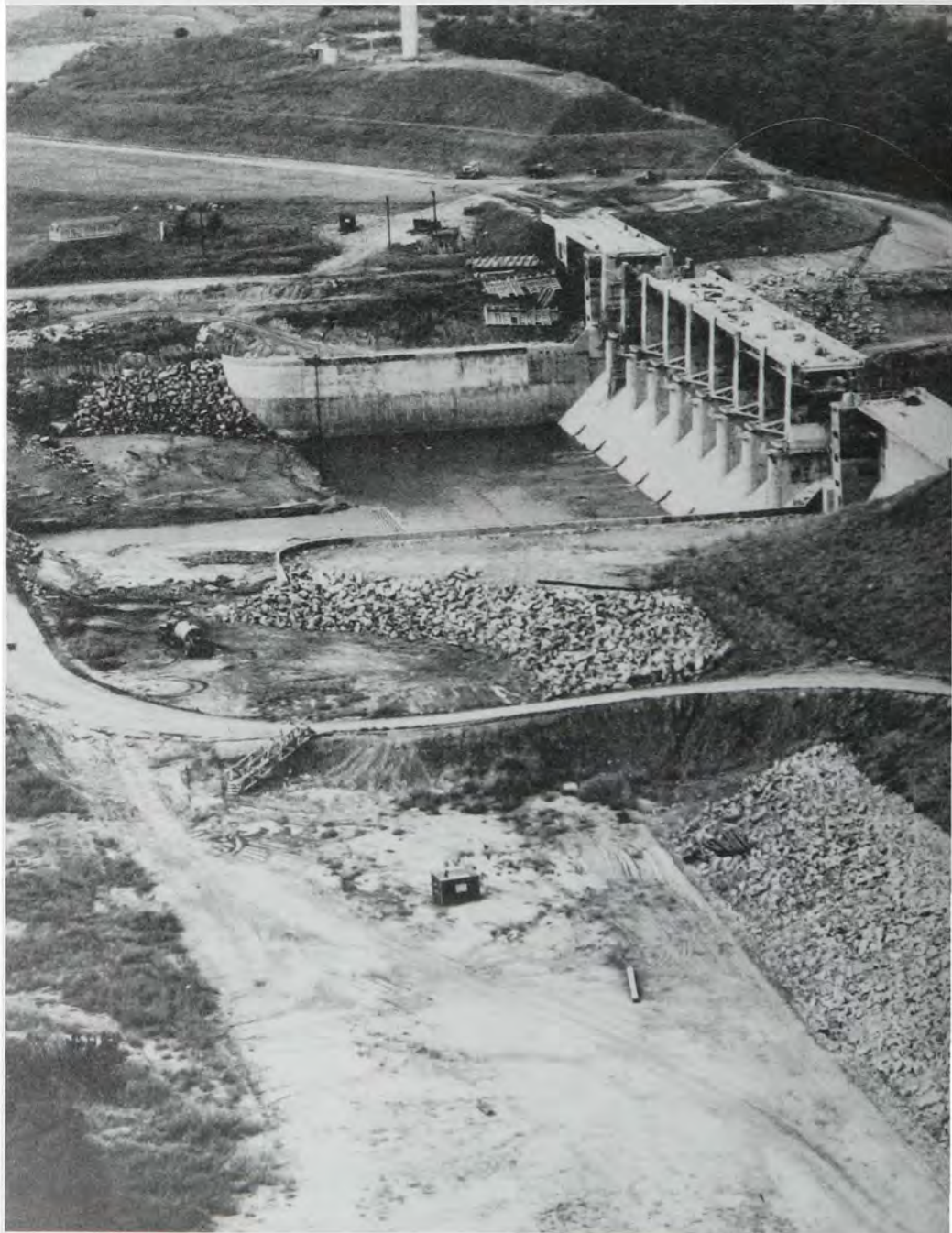




**Four lakes were completed in the 1950s.**



**Construction progress was captured in the Heyburn Lake panorama photo of 1949, top of page, showing building of the embankment and concrete control works. 1953: For Heyburn camp lighting, the District maintained coin-operated change-house lights, above. Hulah Dam construction on the Caney River above Bartlesville was completed in 1951, primarily for flood control. In 1983 a team (right photo) removed a bulkhead after making repairs at Hulah Dam.**



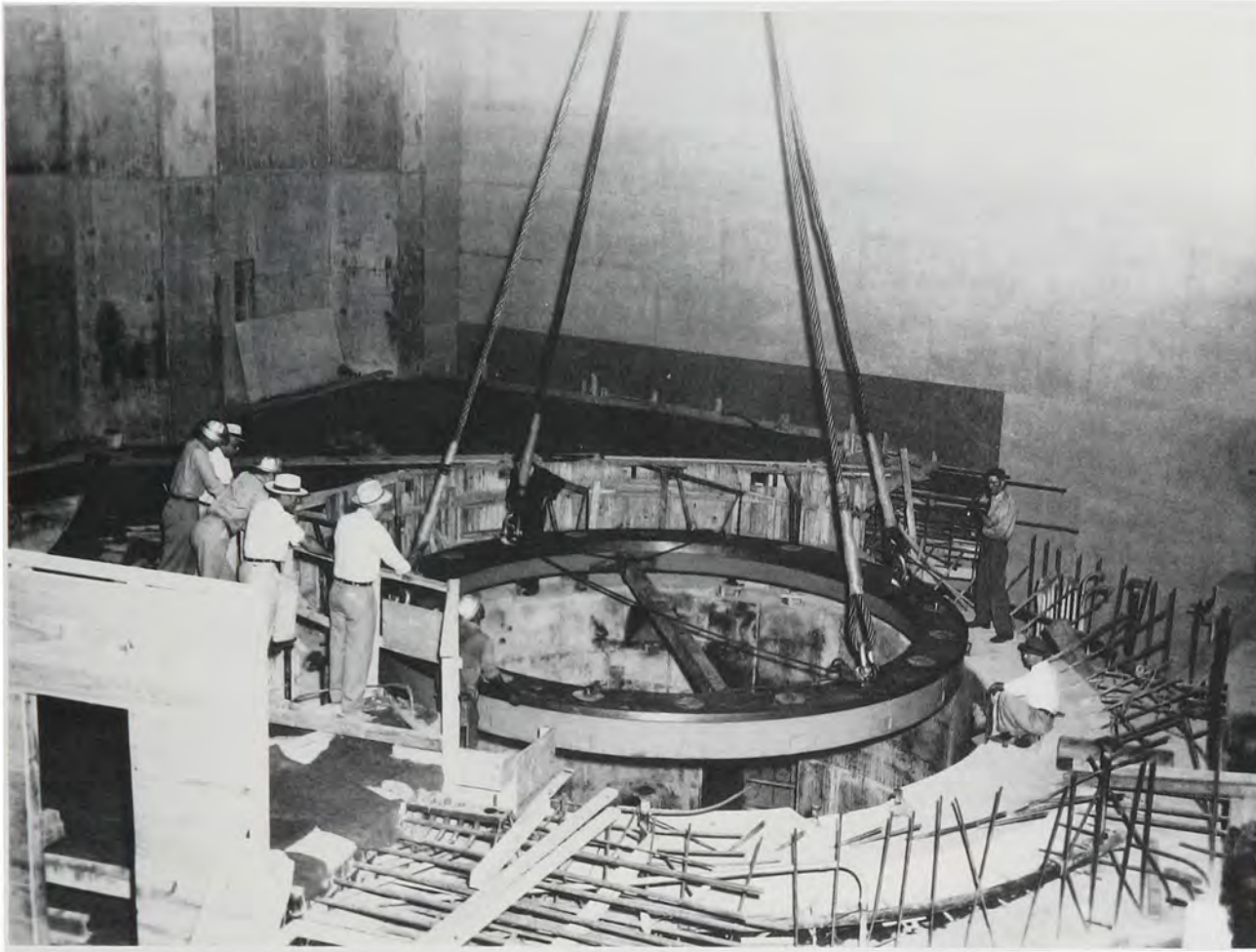




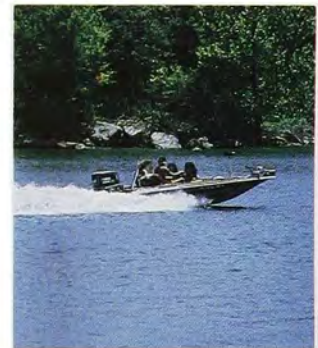
**Plans to dam the Grand River at Three Forks (where the Grand meets the Arkansas and Verdigris Rivers) received a boost from the 1943 flood. Aerial photo of the 1943 flood at Three Forks shows the axis (centerline) of the proposed Fort Gibson Dam.**

**Bottom photo: Workers celebrated pouring the 50,000th cubic yard of concrete for Fort Gibson Dam. The original military outpost, Fort Gibson, was established in 1824 in the hills of eastern Oklahoma where Cherokees maintained a self-governing Indian Nation. Today Fort Gibson provides flood control, water supply, hydropower, and recreation for thousands of visitors each year.**





**Sited at a principal Illinois River crossing named for a famous Cherokee family, Tenkiller Ferry Dam impounds one of the finest lakes in the Tulsa District. Among amenities along the lake's dogwood-studded shores: four nature trails and eighteen park areas. Top photo: straw-hatted engineers oversaw the installation of equipment in the powerhouse that produces an average of 115 million kilowatt-hours of power annually. Cherokee Landing, bottom and right photo, is a popular Tenkiller spot for boating, fishing, and picnicking.**



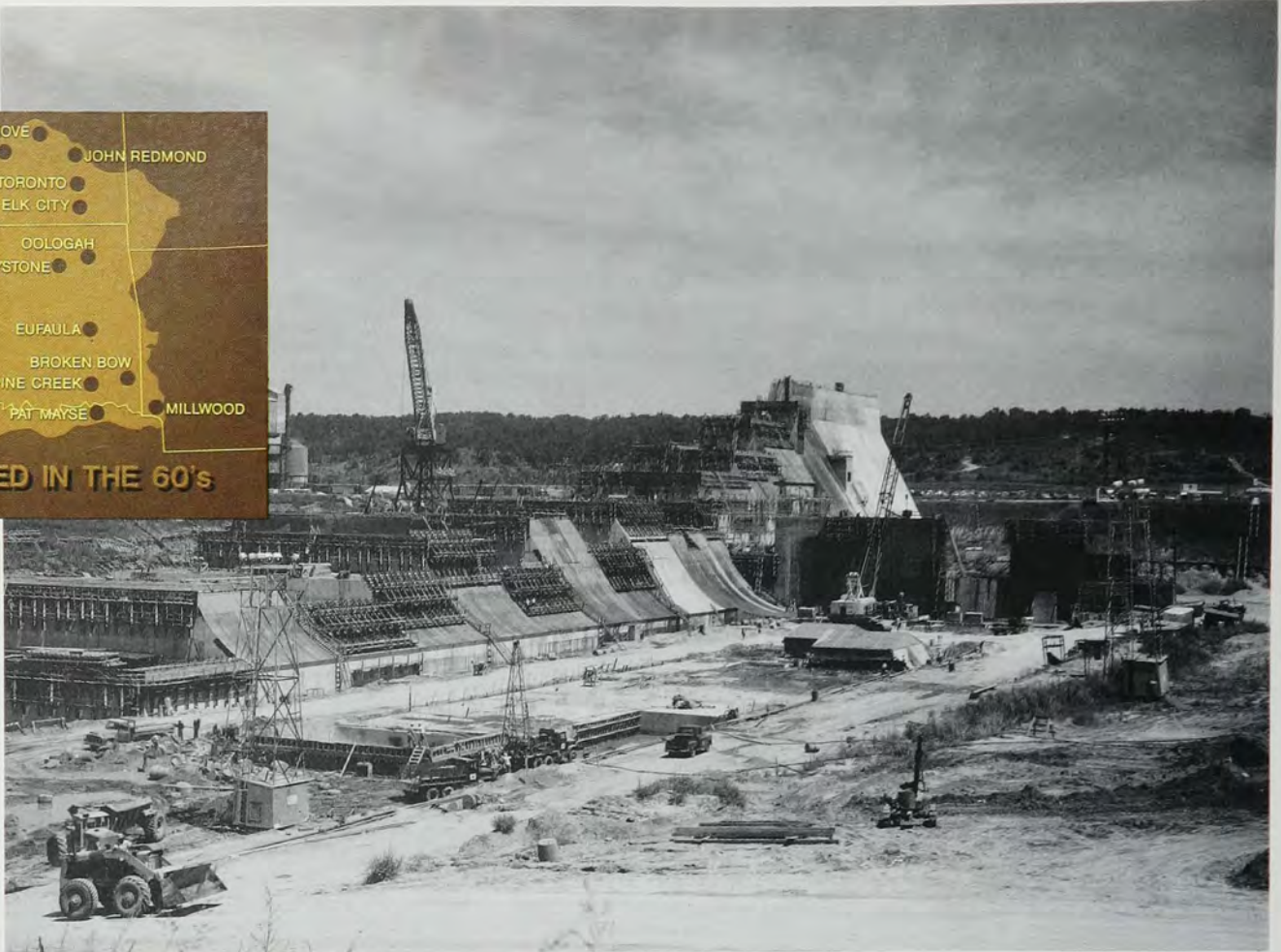
**Summertime, 1953: The Tulsa District dedicated Fort Gibson and Tenkiller on the same day — America's first double-barreled dams dedication ceremony, according to press accounts. Former Sen. Elmer Thomas kicked off the Tenkiller speeches at 10:25 a.m., and Sen. Bob Kerr led off the Fort Gibson ceremony at 3:25 p.m. Festivities included a demonstration of a sport unknown in the area: water skiing.**



**LAKES COMPLETED IN THE 60's**

*Twelve lakes (plus five locks and dams) were completed in the 1960s.*

*Top left photo: In 1961, Keystone Dam's spillway was under construction on the Arkansas River, about 15 miles west of Tulsa. Built principally for navigation, power, recreation, and flood control, Keystone has prevented an estimated \$400 million in flood damages since the dam was completed in 1964.*



*Bottom left photo: Toronto Lake on the Verdigris River in southeastern Kansas opened in 1960. Right: Sailboats stand at attention at an Oologah Lake marina north of Tulsa, in the land of Will Rogers and the historic Cherokee Nation.*



*. . . lift the sail  
and catch the winds of  
destiny  
wherever they may drive  
the boat . . .*

*— Edgar Lee Masters*





**Top photo: Six hundred miles of rugged shoreline surround eastern Oklahoma's Eufaula Lake, under construction in 1961. Bottom photos: John Redmond Reservoir, on the beautiful Neosho (Grand) River in southeastern Kansas.**



***Another lake on the scenic Neosho River in southeastern Kansas, Council Grove, drew a sea of celebrants when it was dedicated in 1964 — although many also carried political signs supporting Lyndon Johnson for President. It is named for Council Grove, Kansas, the origin of the Santa Fe Trail.***

***So lovely was the loneliness of the wild lake . . . and the mystic wind went by murmuring in melody . . .***

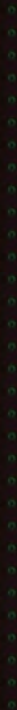
***— Edgar Allan Poe***

*The sun sets at Millwood Lake in eastern Arkansas. Inset photos, left to right: Elk City overlook, southeastern Kansas; Pat Mayse boating, northern Texas; construction of the Marion spillway in central Kansas.*



*Time is the king of men,  
he is both their parent  
and he is their grave,  
and gives them what he  
will,  
not what they crave . . .*

*— Shakespeare*







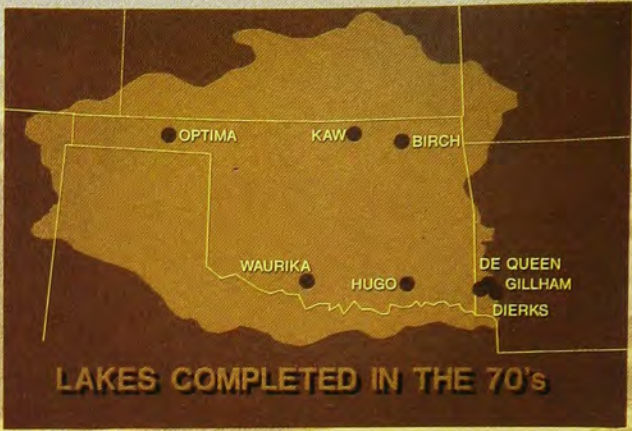
*A fishing couple yield to the lure of Pine Creek Lake on the Little River in southeastern Oklahoma. Some believe Pine Creek and its neighbor, Broken Bow Lake (left inset photos), are the most beautiful lakes in Oklahoma. Two Broken Bow hiking trails wander through the lush Ouachita Mountain country, densely forested*

*with pine, hardwoods, and flowering trees and forest perennials. Right inset: Lake Kemp, near Wichita Falls, Texas, is a locally owned lake. The Tulsa District raised the top of the dam 16 feet and now manages the flood control operations.*

*Little breezes dusk and shiver through the wave that runs forever by the island in the river . . .*

*— Alfred, Lord Tennyson*







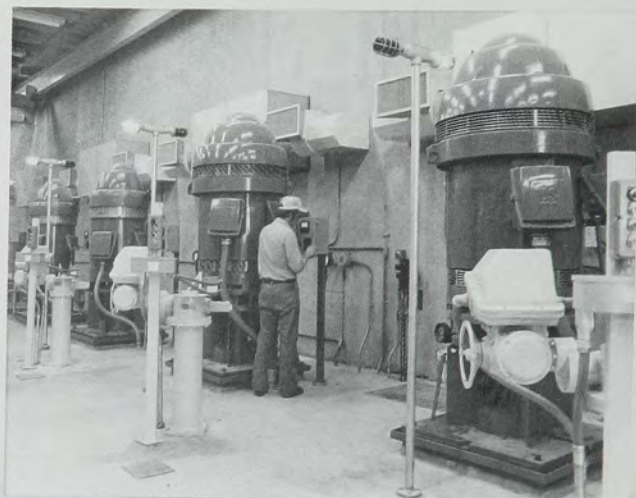
**Eight lakes, plus five locks and dams, were completed in the 1970s.**

**Serenity reigns at both sunset (left photo) and sailing (lower right photo) on Birch Lake, a small (58,200 acre-feet) gem set in the Osage hills northwest of Tulsa. Birch provides flood control, water supply, and recreation. Camping is popular in southwestern Arkansas, where the Tulsa District built Dierks (lower left inset), DeQueen (top left), and Gillham (center left) Lakes in the 1970s.**



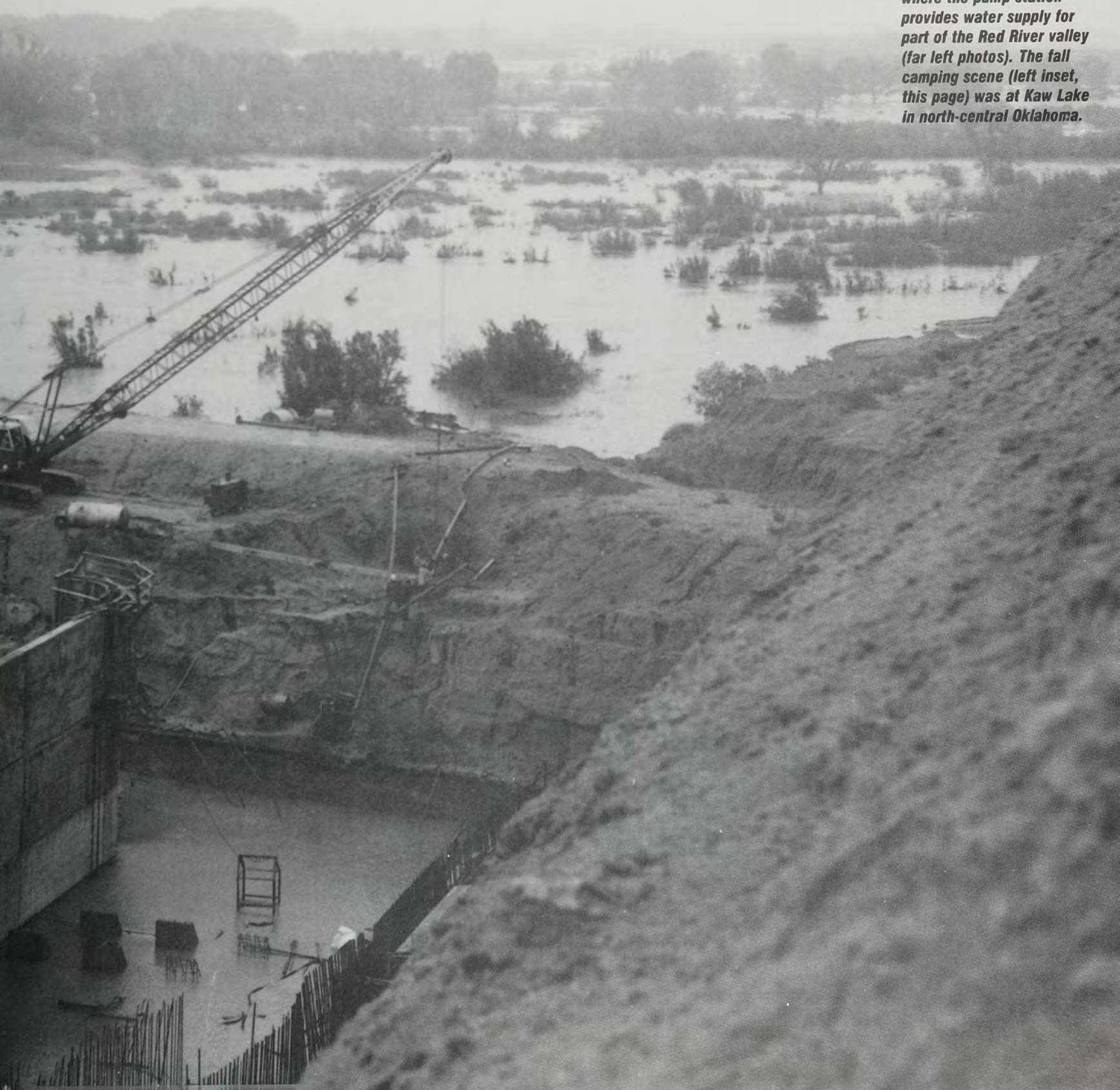
... we pray that strength and courage abundant be given to all who would work for a world of reason and understanding

...  
— Chief Frances Pipestem, Chief, Otoe-Missouri Indian tribe, at 1966 dedication of Kaw Dam.





*Construction of Optima Lake (two-page spread photo) was authorized in the 1936 Flood Control Act and is shown here in 1972. Located in the arid Oklahoma Panhandle, the completed Optima Lake (near right inset) has yet to capture enough water to fill fully. Elsewhere in the state, Rep. Carl Albert spoke at the 1977 dedication of Waurika Lake in south-central Oklahoma, where the pump station provides water supply for part of the Red River valley (far left photos). The fall camping scene (left inset, this page) was at Kaw Lake in north-central Oklahoma.*







*The dazzling vistas of Kerr Lock-Dam-Reservoir draws thousands of visitors each year. And horseback riders flock to the Jean Pierre Chouteau National Recreation Trail that stretches along the waterway from the Port of Catoosa to the Port of Muskogee.*

*Chouteau established the first permanent white settlement in Oklahoma in 1796.*

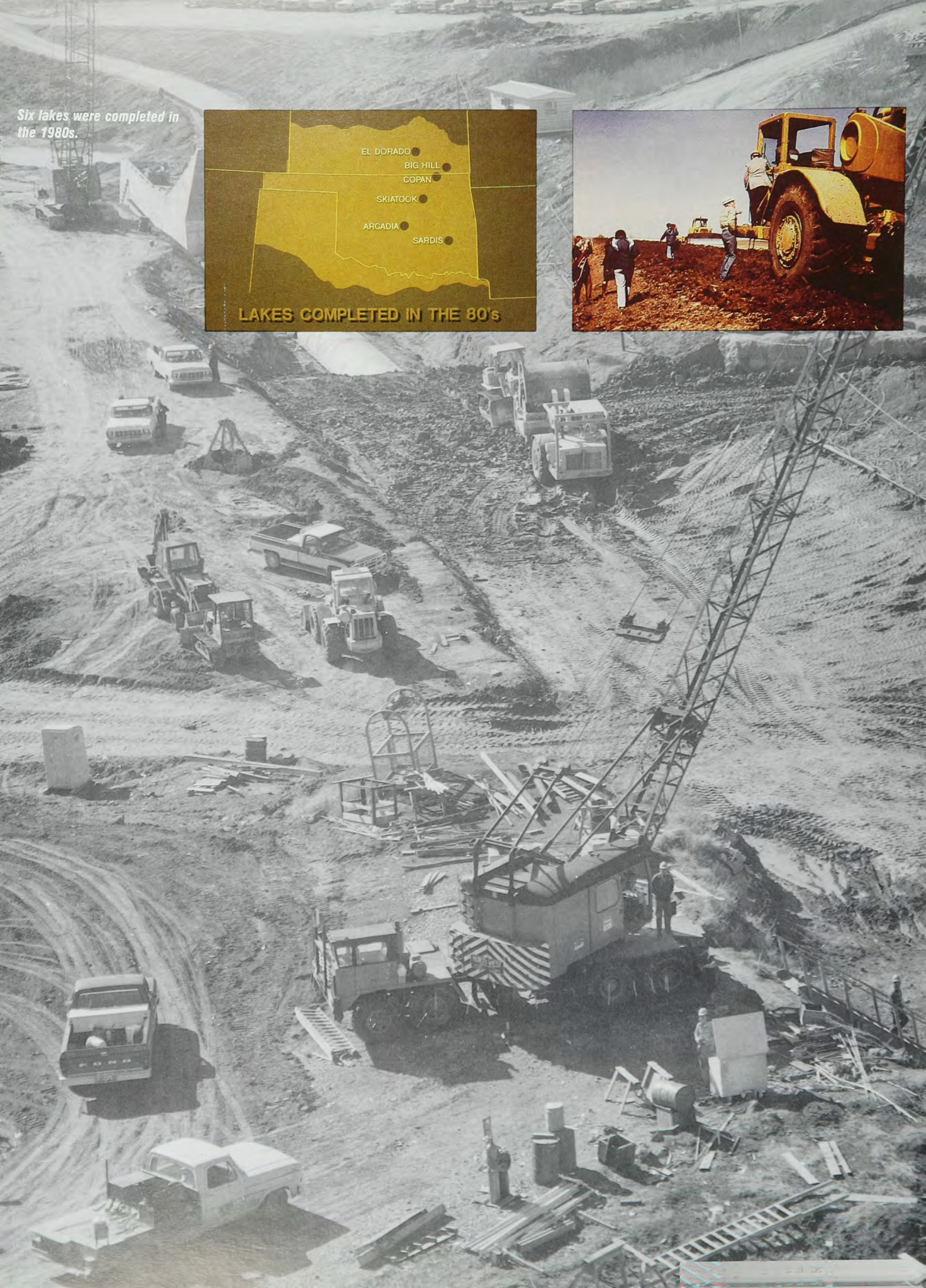
*Inset, this page: a picnic shelter at Hugo Lake blends with the beautiful surrounding area.*

*. . . Few men know how to take a walk. Good observers have the manners of trees and animals, their patient good sense .*

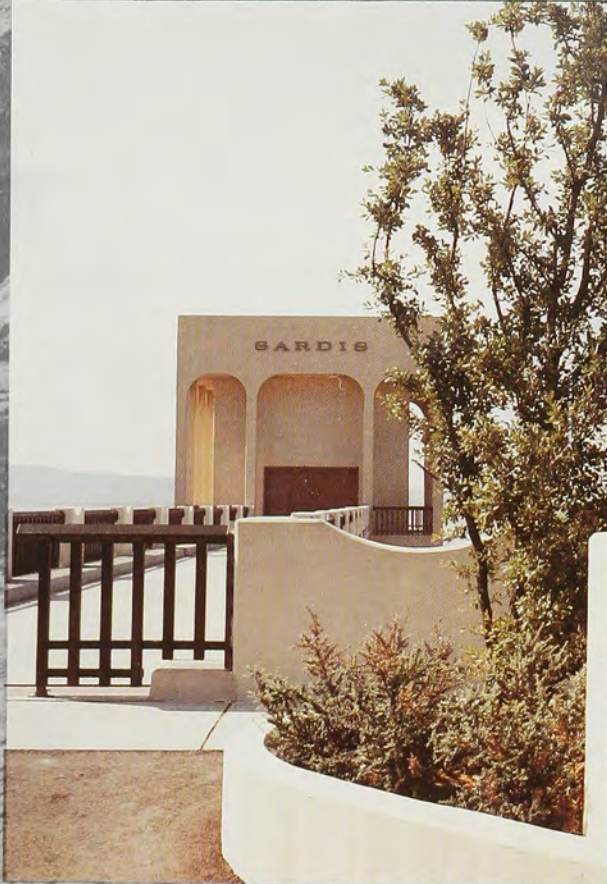
*— Emerson*



Six lakes were completed in the 1980s.



*Construction (double-page photo) of Pearson-Skubitz Big Hill Lake was completed in 1981. Named after "Big Hill Joe," an 1820s Indian leader in southeastern Kansas, the lake was built for flood control, water supply, and recreation. On facing page, the mayor of El Dorado moved the last load of dirt for the embankment of the dam that bears his town's name. Inset, this page: the Sardis Lake intake tower.*



*The valleys of the sea were exposed and the foundations of the land were laid bare . . .  
— Psalms 18:15*



**Top left, construction geared up in 1982 for Arcadia Dam near Oklahoma City, while Copan Lake near Bartlesville opened in 1983. Equipment called a "mole" tunneled through the Osage Hills to help complete Skiatook Dam in 1984.**





Less celebrated are

## **THE SMALL PROJECTS WITH BIG PAYOFFS.**

The big dams and navigation projects may carry the greatest glamour and mystique, but some of the most cost-effective Corps' projects are those grouped under the headings of "local protection projects" or "small projects."

A prime example is at Wichita, Kansas, which grew up along the Arkansas River that cuts squarely through the heart of the city. After years of fighting floods along the river, civic leaders asked the Corps to study flood control possibilities. The project had a stormy local history that took years to resolve, including numerous lawsuits. But in 1959 the project was finally complete: the Corps built a new channel that in effect diverts the Arkansas River around Wichita. The project

***The Tulsa District and the City of Tulsa completed the Joe Creek channel project in 1980, after decades of disastrous flooding.***

**The waters had overwhelmed us, the stream had gone over my soul.**

**— Psalms 124:4**



includes 40.9 miles of diversion channels, 97.3 miles of levees, and five control structures. It provides flood protection to 49,000 acres of urban and suburban property.

By the end of 1987, the Corps estimated that this one project, formally called the Wichita and Valley Center Local Protection Project, had prevented more than \$123.5 million in flood damages. Its original cost was \$18.8 million, of which local sponsors paid \$6.5 million.

Twenty other District projects — channels, levees, and the like — can logically be grouped within the local protection category. In most instances, the Corps called them “small” projects with big payoffs. The Corps estimates that they have prevented nearly one-half billion dollars in flood damages. Another local protection project is under construction at Great Bend, Kansas, and four others are in the final stages of planning.





## Chapter 2 FROM CANDLES TO COMPUTERS

September 28, 1987

Dear Ranger,

I want to thank you for letting us see the dam and for showing us how it works . . . Thank you also for taking us on the wonderful hiking trail. It was fun and very interesting to learn the different types of trees. I just wanted to say thank you.

God bless you.

Pam Holloway<sup>1</sup>

**S**ummer, 1972. The Tulsa District made a rare and important exception to its prohibition against vehicles on the nature trails that abound at many of its projects.

The reason? Little girls — specifically, Brownies, the youngest Girl Scouts — were hiking on the Oologah Lake nature trails, guided by volunteer Owen A. Thomas of the Corps' General Engineering Section.

"One of the most enthusiastic little girls on the hike was a Brownie in a vehicle: a wheel chair," Thomas said later. "She made the entire journey with the help of her Brownie friends who vied with each other for turns at helping guide the chair over the rough spots."<sup>2</sup>

Thus it goes, day in and day out, in the story of the Tulsa District of the U.S. Army Corps of Engineers:

People helping people,  
volunteering, exploring, building,  
setting a firm hand to the wheel when needed,  
lighting black nights,  
bringing sunshine into dark days.  
The quiet joy of a fall day in the woods.  
The sparkle of a sunset on the lake.  
The drip from an irrigation pipe on black earth,  
the hum of power wheeling from the dam to a hospital.  
Thus it goes, day in and day out:  
steady, dependable, uncompromisingly friendly.  
And thus it has gone for 50 years.

**The Tulsa District is people. Left, Boy Scouts built a footbridge at Keystone Lake. And the District's "mom and pop" policy put people like Vick and Mitzi Will in the booth as gate attendants at an area lake.**



For, ultimately, the Tulsa District is more than just a collection of projects, no matter how significant each project may be individually.

Taken altogether, the Tulsa District constitutes a total program, centered around water resources development and management, founded on the firm rock of military preparedness. That total program is more than the sum of its parts. Its effectiveness is best measured in human terms, resting squarely on its peoples' shoulders.

The success of that program, which included other parts, has much to do with what Tulsa District employees describe as "the Corps family."

The secret lies

### **IN HAVING MORE THAN ONE PURPOSE.**

A formula for success by the Tulsa District — and the Corps of Engineers as a whole — has been that its projects and programs achieve multiple benefits. They generally serve more than one purpose. Any given lake may be used for flood control, power, navigation, recreation, fish and wildlife management, water quality enhancement, irrigation, and water supply.

In institutional terms, providing for multiple uses of water has strengthened the Corps over the years by establishing a diverse constituency and client base.

The practice has also allowed many more projects to be justified economically and, therefore, built. But the larger benefit of multi-purpose projects is synergism: the whole of the system exceeding the sum of its parts. Doing a number of things with the same resources expands the benefits exponentially, as each benefit enhances the others.

In addition to navigation, which was described in the previous section, the Tulsa District program has included several of these benefits:

**FLOOD CONTROL.** In the Tulsa District's first 50 years, one theme has been more pressing than all others: flood control. It is the major function of most of the Tulsa District projects.

## **AFTER THE FLOOD**

*The broken dike, the levee washed away,  
The good fields flooded and the cattle drowned,  
Estranged and treacherous all the faithful ground,  
And nothing left but floating disarray  
Of tree and home uprooted — was this the day  
Man dropped upon his shadow without a sound  
And died, having labored well and having found  
His burden heavier than a quilt of clay?  
No, no, I saw him when the sun had set  
In water, leaning on his single oar  
Above his garden faintly glimmering yet —  
There bulked the plow, here washed the updrifted weeds —  
And scull across his roof and make for shore,  
With twisted face and pocket full of seeds.*

— Edna St. Vincent Millay



Much of the rhythm over the years has been to the periodic beat of floods, demands for flood control, and actions to stem future floods. Any examination of the Tulsa District's accomplishments rightly begins with flood control.

Sixty-five of the District's reservoirs and other projects have included flood control storage or protection measures. Those projects range from big reservoirs and channels to the Arkansas River levees at Tulsa. In some instances, the floodplain or flowage easements were purchased to reduce or eliminate flood damages. Lake projects provide 16 million acre-feet of flood control storage.

With its location in tornado alley, in an area subject to freak rainstorms, the Tulsa District sustains some of the most frequent and disastrous flooding in the United States. But the good news is that Corps projects have prevented more than \$2 billion in potential flood damages in the Tulsa District over the past five decades.

**WATER SUPPLY.** "We wanted to be in a free state, but I reckon there ain't no freedom here except to die of thirst," wrote an anti-slavery farmer who moved to Kansas before the Civil War.<sup>3</sup>

In a dust-parched region, the lure of water has often been overwhelming. Natural water supplies vary from abundant to critically sparse across the Tulsa District. Therefore, one of the most important functions of Corps projects is to provide or augment supplies of fresh water for urban and farm dwellers throughout the region.

Water from Corps' reservoirs can be used for irrigation, as authorized by Congress in 1944, and for municipal and industrial water supplies if the users repay the costs. Tulsa District projects contain two million acre-feet of water supply storage.

**HYDROPOWER.** The Tulsa District region moved from candles to computers in a single generation with the help of the Corps of Engineers' hydropower program.

The hydropower principle powered the old water wheels that ground the flour that fed pioneers. Now, by again tapping energy from falling water, hydropower provides clean, renewable energy that is often more economical than alternate sources.

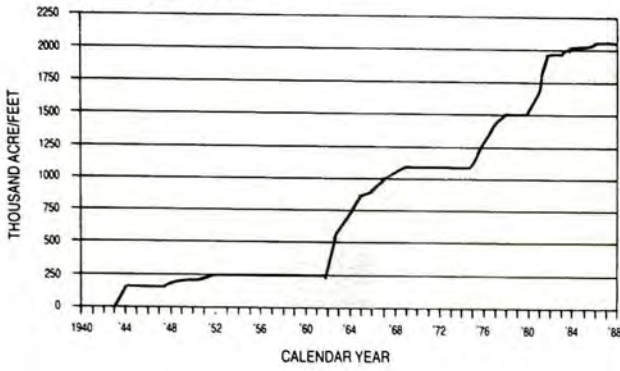
Federal responsibilities in power production have evolved from the days when Oklahoma Gov. Red Phillips tried to evict federal construction workers from the Denison Dam powerhouse site. Today eight Tulsa District projects produce power — Eufaula, Fort Gibson, Keystone, Kerr, Tenkiller, Webbers Falls, Broken Bow, and Texoma. The GRDA produces power at Pensacola Dam and Lake Hudson. The power produced is marketed through another federal agency, the Southwestern Power Administration, and regulated by still others.

More than 46 billion kilowatt-hours of electricity have been "sold" from District projects since the first power was produced at Denison Dam in 1944 — enough electricity to light three million homes for an entire year. That's about \$3.3 billion worth of power.

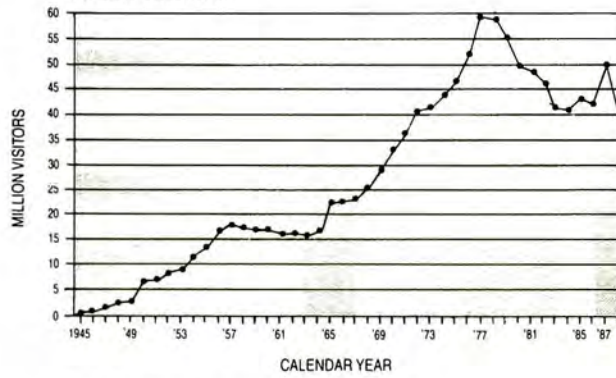
Federal policy has changed in the past decade to encourage more private involvement in hydropower projects. Today, the Corps plans, constructs, and operates hydropower projects only when it is impractical for non-federal interests to do so. In most instances, hydropower facilities at Corps projects are now developed by non-federal interests, and the Tulsa District's role is largely one of coordination and license review. For example, the Oklahoma Municipal Power Authority has added hydropower at Kaw Lake. The Cherokee Nation of Oklahoma has been approved to design, construct, and finance generating facilities at W.D. Mayo Lock and Dam on the Arkansas River waterway. Non-federal interests are also working toward constructing hydropower facilities at six other Tulsa District projects.<sup>4</sup>

**RECREATION.** From the Great Salt Plains boat races in the 1950s to Tulsa's Labor Day Great Raft Races on the Arkansas River in the 1980s, people have been drawn to the water's edge. In recognition of this need, Congress in 1944 authorized the Corps to build, maintain, and operate public park and recreation facilities at its projects, whose waters and lands are to be open for public use and enjoyment.

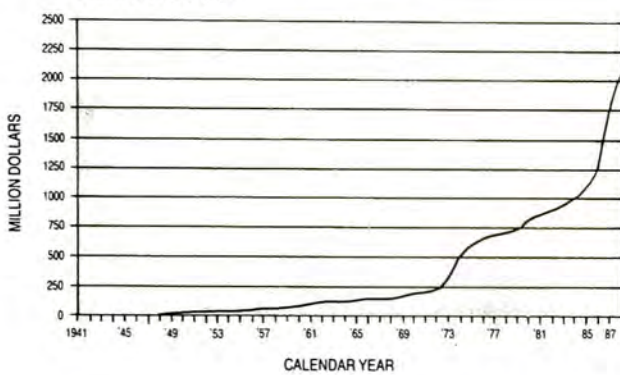
**TULSA DISTRICT WATER SUPPLY CUMULATIVE TOTAL**



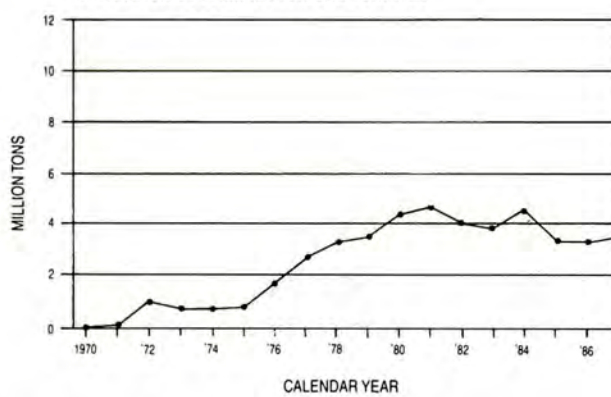
**TULSA DISTRICT HISTORICAL VISITATION AT LAKE PROJECTS**



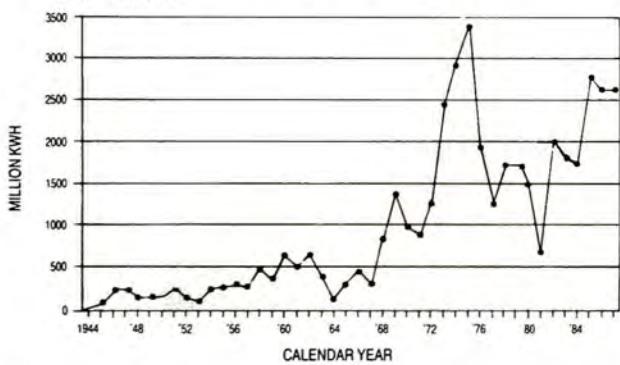
**TULSA DISTRICT FLOOD DAMAGES PREVENTED CUMULATIVE TOTAL**



**McCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM HISTORICAL TONNAGE**



**TULSA DISTRICT HISTORICAL HYDROPOWER PRODUCTION**



**The record speaks well for the Tulsa District. Graphs trace development of water supply, flood control, hydropower, recreation, and navigation over the past 50 years.**

## DUSENBERRY IS GOODWILL AMBASSADOR

**M**allard Bay, OK; Sept 26, 1988 — Triple handicaps (deaf, nearly blind, and learning disability) can't keep Ronnie Dusenberry from making his rounds, several times each day, to pick up litter at Fort Gibson Lake. A charter member of the Mallard Bay access point volunteer lake patrol, Dusenberry shows friends the special Certificate of Appreciation he received from the Tulsa District, U. S. Army Corps of Engineers, for his work. "Visitors to the park find Dusenberry's enthusiasm for a clean park contagious," said Tulsa District Engineer Frank Patete.<sup>5</sup>



**Ranger Billye Fears, left, and an unidentified man encouraged Ronnie Dusenberry with a special award granted for project cleanup work.**

Tulsa District lake projects today include nearly 30,000 acres of developed parklands with 12,800 campsites, 720 picnic areas, 425 boat ramps, and more than 100 recreation trails that stretch nearly 200 miles in total length. The lakes' shorelines stretch nearly 5,000 miles — roughly equal to a round trip between Los Angeles and New York.

Pick a project, any project, and you will find that the reach of recreation opportunities exceeds the grasp of even the most frequent visitor.

For example, Elk City Lake, one of the smaller projects, was completed in 1966 on the upper Verdigris in southeastern Kansas near Independence. The reservoir was built primarily for flood control but also for water supply, recreation, and wildlife purposes. Tableland rock bluffs on the north give way to rolling meadows and clusters of ash, birch, elm, hickory, oak, walnut, sycamore, dogwood, hawthorn, redbud, holly, sumac . . .

What can you do at Elk City? Swim, boat, water ski, camp, picnic. Hike in the fall woods. Fish for crappie, channel catfish, white bass, largemouth bass, sunfish.

Would you rather hunt somewhere on the 12,000-plus acres of game preserve? Look for bobwhite quail, cottontail rabbit, mourning dove, greater prairie chicken, fox squirrel, deer . . .

You can have your choice of four parks for picnicking and camping, with swimming beaches, boat ramps, water wells, bathhouses, fireplaces, and shelters.<sup>6</sup>

What is the value of a day on the water, an afternoon in the woods? The answer, multiplied by the 1.2 billion visitor-days logged at Tulsa District projects over the past 50 years, lays bare the significant value of the Corps' recreation program.

**RESOURCE MANAGEMENT.** Other project purposes protect various critical resources that help sustain the web of life. For example, storage in a lake may include reserve water that can be used to regulate stream flows and maintain high water quality. Land may be set aside for carefully managed wildlife preserves; the District places a high priority on improving fish habitat at Corps projects.



### 300,000 MALLARDS

**“A** small flock of a dozen or so mallards swung over the decoys . . .

“As they side-slipped down, their long necks craned forward and their orange, webbed landing gear came down. Just three hens in the bunch, they settled in among the bobbing decoys nearly 15 yards from our camouflaged boat pulled up into the tall cattails.

“Beautiful,” I whispered to Conrad, but neither of us reached for our shotguns . . . [W]e didn't want the day's shooting to end before sunrise. With 300,000 mallards cranking around the Sequoyah National Wildfowl Refuge, we wanted to squeeze in every drop of enjoyment possible by sampling the variety of duck hunting here.

“It would be no trouble to fill our limits, it was just a matter of when . . .”<sup>7</sup>

A prototype of the Corps' wildlife management areas, Sequoyah Refuge is located southwest of Sallisaw in eastern Oklahoma. The Corps bought the 20,800 acres to help mitigate the loss of wildlife habitat when the Arkansas River waterway was built.

The Tulsa District has some three dozen projects in which 600,000 acres of fish and wildlife management areas are maintained — a treasure-trove for sportsmen and outdoor lovers. The primary goal of this program is to provide enjoyment and recreation opportunities while improving habitat for fish and wildlife, thus protecting the species diversity necessary to preserve life on this earth.



## Chapter 3

# **DINOSAURS AND COCKROACHES: THE ERA OF THE ENVIRONMENT**

**“Remember the story of the dinosaur and the cockroach?”** asked a long-time observer of the U.S. Army Corps of Engineers.

The time was the late 1970s. The speaker was a nationally known television journalist who had reported for years on activities of the Corps. The occasion was a panel discussion about the Corps and the environmental movement.

“In the history of evolution,” the journalist said, “the cockroach is far superior to the dinosaur. The cockroach adapted to changes in its environment; the dinosaur did not. You can see which one survived.

“Look at the Corps: it’s a massive organization with great stability, but changes are difficult if not impossible to effect. The environmental movement poses a life-and-death question for the Engineers: Must the Corps be a dinosaur, or can it adapt like the cockroach?”<sup>1</sup>

The Tulsa District has faced its own challenges in the era of increased environmental concern, as well as its ability to answer the journalist’s question.

***Environmental danger lurks beneath the surface of Pay Mayse Lake, in an innocent-looking water plant, Eurasian Watermilfoil. Its rampant growth can form a solid mat of vegetation that blocks lake use and has caused at least one drowning. These Tulsa District workers are treating the plant to enhance control.***





**The environmental movement of the 1960s and 1970s helped bring more citizens into direct participation in their government. The Tulsa District changed procedures to listen more effectively to citizens such as these Tulsans advocating Joe Creek flood control. Among participants: Col. Pinkey, seated in front row, third from right.**

**SILENT SPRING.** At about the time Rachel Carson published *Silent Spring* in 1962, warning of ecological dangers facing mankind, the environmental movement began to force the Corps to re-examine its policies.

Two trends in government at that time were destined to impact the Corps greatly:

- The trend of minority and special-interest groups to demand greater participation in decision-making; and
- The trend to force government agencies to consider the environmental effects of their actions.

In the 1970s two authors studied the response to those trends by five major federal agencies. From a study published by the prestigious Brookings Institution (*Can Organizations Change? Environmental Protection, Citizen Participation, and the Corps of Engineers*) came a revealing conclusion: “despite legislation, administrative rules, and public pressure, little had changed in the decision making and environmental practices of most federal agencies.”

They found one exception: “The Army Corps of Engineers . . . viewed by many as the epitome of a well-entrenched bureaucracy . . . seemed to be making a conscious and serious effort to accommodate itself to the spirit of the environmental movement as well as to the letter of the law.”

The Brookings Institution was amazed at this discovery. Was this the same Corps commonly viewed as an impenetrable fortress, the same Corps that Franklin Roosevelt once called “the most difficult foreign power I have to deal with?”

Intrigued, the researchers looked further and concluded that, while economic development remained the first goal of the Corps, the agency had adopted a second goal of environmental quality.

The two goals co-exist “uneasily,” but the Corps was moving toward parity, the authors said. They quoted one of the Corps’ top engineers in 1976, Maj. Gen. (and former Tulsa District Engineer) John W. Morris: “During our studies, our planning and designing, we listen carefully to the voices of opposition, regardless of how emotional they may be, because it is in the adversary arena where views are exchanged, knowledge is gained, and compromises are reached . . . The right way is to balance actions, consider all sides, and make decisions based upon those considerations which are the greatest benefit to the most people.”<sup>2</sup>



**NEW VOICES.** Meanwhile, in the Tulsa District — at the farthest reaches of Corps staffing, the district level, at the “end of the whip” of policy changes — the new voices were being heard. In the fall of 1967, the Tulsa District established a new Environmental Resources Section in the Planning Branch.<sup>3</sup>

Col. Rebh described the new emphasis on what he called environmental engineering, on such “intangible values” as scenic beauty, architectural design, wilderness preservation, and historical and archaeological values — the “cultivation of beauty and the creation of a total, healthy environment.”

Robert M. Black was the first chief of the new section. Subsequent chiefs included Jerry L. Greer, Buell Atkins, and Paul Mace.

Several rounds of federal legislation strengthened the environmental thrust and gave the Corps expanded environmental responsibilities:

- In 1969, the National Environmental Policy Act required environmental impact assessments or statements examining impacts and options before major federal actions were taken.
- In 1972, the Water Pollution Control Act Amendments to the 1969 law made the Corps responsible for issuing “404” permits to regulate dredging and filling in U.S. waters. The 1972 amendments also established a broad new Corps program called urban studies, through which the Tulsa District conducted the Tulsa Urban Study in the 1970s.
- In 1974, Public Law 93-251 authorized the Corps for the first time to study what are called nonstructural flood control projects (such as regulations or purchase of floodplain lands rather than building flood control dams). In the same year, Congress also enacted the Archaeological Act, allowing up to one percent of project costs to go toward archaeological work.

As the District concludes its first 50 years, its Environmental Resources Branch contains nine professionals. Their academic specialties range from anthropology to zoology. Two have Ph.D.s and five have master’s degrees. Their work ranges from environmental studies on the ecology and biology of plants and animals to technical analyses of surface water quality. They prepare environmental impact statements and maintain close coordination with agencies such as the U.S. Fish and Wildlife Service. Archaeology and recreation planning are also among their responsibilities.

*Where eagles dare and pelicans pause . . . the Tulsa District wildlife management programs were boosted during its second quarter-century of life. Below: Paul Mace.*

**I learned that there is a beyond to every place — and the bird moving through the air by successive dartings taught me.**

— Emerson



**A SLICE OF HISTORY** Did the Tulsa District of the U.S. Army Corps of Engineers make history, in its own right, in discovering and preserving history?

Yes, according to the Southwestern Division history, published recently to commemorate SWD's 50th anniversary.

The SWD history strips modesty from the Tulsa District's account of its own leadership in the field of archaeology and paints a picture of the Tulsa District leading the field nationally.

The story begins with scattered attempts at archaeological investigations, beginning in the 1930s through the Works Progress Administration. The largely unproductive attempts continued until a band of amateur and professional archaeologists in the Tulsa District created their own team to investigate and preserve, insofar as possible, the significant cultural resources in the Tulsa region. That team's work became a model upon which national legislation and programs were built.

Even as the Corps was building its unprecedented national construction program in the 1930s, resulting in destroying numerous historic sites, the Corps involvement in archaeology was "minimal and perfunctory," writes Dr. D. Clayton Brown in the SWD history.

"Cultural resource management was totally unknown; economic development took precedence over environmental considerations, as it did throughout the United States in both public and private sectors. During World War II, however, this condition changed in the Tulsa District, partly by chance, partly by direction, and perhaps due to the wealth of archaeological sites in Oklahoma."

The District's commitment to cultural preservation was spurred in part by a tragedy that befell Spiro Mounds in southeastern Oklahoma, one of the most significant archaeological sites in North America. This 100-acre site at a bend of the Arkansas River included nine prominent burial mounds containing remains and relics of a priestly hierarchy, class structure, and ceremonial village of the Caddoan Indians, a complex prehistoric society that dates back to around 900 A.D.

The Spiro Mounds were discovered around 1900, in one of the most significant archaeological finds of the 20th century. But in the 1930s, they were plundered and dynamited by a commercial company.

**SOMETHING OLD.** "Perhaps it was the excitement — and tragedy — of Spiro Mounds that first generated an awareness of archaeology within the Tulsa District," Dr. Brown wrote.

Spurred by the personal interest of Col. Chorpene in historic preservation, the Tulsa District took advantage of a narrow window of opportunity when the 1944 Flood Control Act authorized recreation facilities. The District expanded the definition of park to include archaeological sites and lured the Smithsonian Institution and the University of Oklahoma to assign OU's archaeologist to survey Fort Gibson and Tenkiller Ferry sites before construction.

By the end of World War II, the Tulsa District was ripe for archaeological work. The District had one of the largest reservoir workloads in the country and was ready to work on them. Through OU and other professional archaeologists, the District conducted surveys of reservoir sites before they were flooded. In 1946, additional investigations occurred at Wister Lake along Fourche Maline River in southeastern Oklahoma.



**A conch shell effigy from Craig Mound at Spiro, Oklahoma.**

**Searching for the treasures of the past, archaeologists dig at John Redmond, right, and Webbers Falls Lakes. Archaeologist Mike Corkran, center, led amateurs in the Webbers Falls dig.**



Throughout the 1960s, following the 1960 Reservoir Salvage Act, the District worked closely with the Park Service to conduct archaeological investigations and salvage excavations.

This practice, however, was still known in the field as “crisis archaeology,” conducted with little advance planning and limited funds. As late as 1973, the National Park Service, charged by Congress to lead in archaeology, received only \$3 million annually for that purpose.

In the meantime, the Tulsa District continued its work. Calling it a park, the Tulsa District bought land at Spiro Mound and leased it to the state in 1972 for development as an interpretive center.

**SOMETHING NEW.** In 1970, the Tulsa District’s Larry Banks, a geologist with lifelong experience in archaeology, became the first titled Corps archaeologist in the U.S. Banks had strong backing from Myron DeGeer, then head of the District’s Engineering Division and a longtime amateur archaeologist.

It was not until the passage of the 1974 Archaeological Act that other Corps districts began hiring fulltime staff archaeologists. That landmark act allowed agencies to spend up to one percent of a project’s construction costs on archaeological work on that project site. The Tulsa District provided leadership in implementing this new law; Banks was among four members of a federal task force that drafted implementing regulations.

The District archaeological program has evolved over the years through leadership from archaeologists such as Sue Purves, Wayne Shields, Daphnie Dervin Wilcox, Mike Corkran, and Dr. Kenneth Ashworth.

“Most of what is known about the prehistory of Kansas and Oklahoma has been the direct result of research and salvage programs funded by the Tulsa District,” says Corkran, chief of cultural resources since 1980.

Scarce funds have precluded necessary archaeological work on some projects, but innovative work by District archaeologists has preserved and salvaged many important prehistoric sites, he says.

“The Tulsa District has been the most innovative and has maintained the longest on-going Corps of Engineers archaeological program in the nation.”

**FLOODPLAIN MANAGEMENT.** Among other significant trends in the Corps’ history was the push toward nonstructural floodplain management.

The Corps’ number one flood control success, in the view of the Corps’ number one engineer, is a little-known program that builds, basically, nothing.

Lt. Gen. H.J. Hatch, Corps Chief Engineer, confessed in a 1988 speech that he has a “passion” for this program: floodplain management services.

Floodplain management is based on the theory that flood damages increase where people use floodplain lands unwisely. “Building in the way of the water,” on floodprone lands that certainly will be flooded, means there certainly will be flood damages unless the builder takes prudent precautions, such as building on stilts or piers.

Hatch recalled that 13 years earlier, he was commanding the Corps’ Nashville District when a flood filled all their reservoirs to the brim and beyond.

“Even with all our reservoirs working at full capacity, the flood was still worse than anything in recorded history,” he said.

“I remember flying over Carthage, Tennessee, and viewing the extensive flooding of properties that had been built in the flood plain on land that had been vacant just a few years earlier when the Corps prepared a flood plain information report for the community. This was an eye-opening experience and the source of my passion for flood plain management,” Hatch said.

“FPMS (floodplain management services) is, in my view, the model of effective Federal investment. The benefit/cost ratio for the FPMS program exceeds anything else the Corps of Engineers is doing and probably anything the entire federal government is doing to reduce flood damages. The nation is receiving billions of dollars in return for the few thousands invested in flood plain management services.”<sup>4</sup>

Through the floodplain management services program, the Corps provides accurate information

to citizens and government offices about the possibility, for example, that a specific tract of land has flooded or could flood. The theory is they will use that information to guide decisions that will lead to wise use of floodplain lands.

In the 1960s, the Corps was authorized to get into the floodplain management business after studies documented that U.S. flood damages were rising faster than flood control works could be built to control flooding.

In 1967, Jerry L. Greer was named assistant chief of engineering for flood plain management services for the Tulsa District. With floodplain management, Greer said, the Corps was moving away from just “keeping water away from people” toward also “keeping people away from water.” Greer was followed over subsequent years by floodplain management chiefs E.T. Kimbrough, Carroll Scoggins, Ed Endacott, and Joe Remondini.

Since it began in Tulsa, the program has responded to about 250,000 requests for information about flood hazards and now answers about 13,000 a year.

Local officials have echoed Lt. Gen. Hatch’s praise for the floodplain management program. “The Tulsa District’s floodplain management program has been a major factor in our progress in the City of Tulsa floodplain policies,” said Tulsa’s Street Commissioner J.D. Metcalfe. “Since the early 1970s, the Tulsa District has provided information, over and over again, that we have used in our public and private decisions relating to floodplain developments. It would be impossible to overestimate the value of this program in the Tulsa community.”<sup>5</sup>



***Under water again, the neighborhoods around Kingfisher Creek in central Oklahoma were built before the Corps developed its floodplain management programs in the late 1960s. Above: Tulsa District floodplain management staff has included, top to bottom, Ron Kerr and Kent Hisey; Ed Endacott; Joe Remondini.***



## THE NIGHTMARE 1986 FLOOD

*It's a kind of specific job hazard that goes with work at the Corps of Engineers: You wake in the dead of night, filled with dread, from a nightmare in which the rains pour down unceasingly, unmercifully, filling all available lakes — and the rain never stops. Sometimes in the dream you are the one in charge, the one who has to make the no-win decisions in which, inevitably, uncontrollable torrents of water flood cities, towns, and farms, while you watch helplessly.*

*The nightmare came true in the Tulsa District in the closing week of September 1986, when unprecedented rains put the District's flood control system — and its staff — to their severest test.*

*As much as 25 inches of rain — in some cases, more than normally falls in a year — fell over eastern Oklahoma. Every river in the District's Arkansas River system flooded. Flood control lakes filled to the brim. And still the rains fell.*

*When runoff exceeded the system's capacity, extensive flooding occurred. Some disaster areas, such as Bartlesville and Tulsa County, were just downstream from Corps dams.*

*Angry flood victims blamed embattled District engineers, but other residents turned out in record numbers to fill*

*thousands of sandbags airlifted by the Tulsa District.*

*Despite their best efforts, the fall 1986 floods left \$283 million in damages, including \$63.6 million in Tulsa County and \$40 million in Washington County (which includes Bartlesville), Oklahoma. Two people died, and 43 counties were declared disaster areas.*

**Keystone Dam flood gates earned their money with the workout they received in the 1986 flood, while workers monitored rising flood waters throughout northeastern Oklahoma. The Tulsa District distributed sand bags by the truck load during the 1986 flood.**



*The only good news was that it could have been far worse. Without the Corps flood control system, damages would have been in the range of \$1 billion, perhaps three times worse than actually occurred. Corps' analysts compared the storms' potential damage to the 1943 flood, when the Arkansas River swelled as much as 8 miles wide and 26 people died in the watershed then sparsely populated.*



## Chapter 4

# SEARCHING FOR EXCELLENCE IN A NEW AGE

*“There is good news from America. Good management today is not resident only in Japan. But, more importantly, the good news comes from treating people decently and asking them to shine, and from producing things that work . . .*

*“[E]xcellent companies seem to take all kinds of special trouble to foster, nourish, and care for what we call ‘product champions’ — those individuals who believe so strongly in their ideas that they take it on themselves to damn the bureaucracy and maneuver their projects through the system and out to the customer.*

*“Someone piped up: ‘Champions! Our problem is we can’t kill them.’”<sup>1</sup>*



**L**ike the authors of *In Search of Excellence*, who sifted through American management looking for businesses that matched their philosophy of efficiency, the Tulsa District entered the modern age searching for better ways to do its job.

The trend was toward leaner, but not meaner, management — killing sacred cows, not champions. And in the champion-building style of the private companies cited by *In Search of Excellence*, before the end of its first 50 years, the District was chosen as the first Corps “Model District,” a Corps’ pseudonym for a laboratory for management innovations.

### **SIXTEEN LEAN YEARS.**

But first the challenge was to survive the years between 1970 and 1986, when water resource construction programs virtually shut down in the United States.

Sixteen fat years of record civil works construction in the Tulsa District, from the mid-1950s through the 1960s, were followed by 16 lean years. Between 1970 and 1986, Congress approved no omnibus water bills. And no major civil works projects were authorized for the Tulsa District.

The last project into the pipeline, Arcadia Dam near Oklahoma City, was authorized in 1970. Arcadia was one of only four new construction starts in the country during the Carter Administration (1977- 1981).<sup>2</sup>

The sailing was far from smooth for even authorized projects, such as four dams on tributaries of the Verdigris River northwest of Tulsa. Skiatook, Birch, Candy, and Sand Creek dams were authorized in 1962. All were in Osage County where the Osage Indian Tribe owns the right to oil that lies beneath the land surface.

When the Corps determined the area that would be flooded by Skiatook Lake and began negotiations, the Indians’ asking price for the mineral rights was so far above Corps’ offers that there was no hope of agreement without condemnation proceedings. But a court decision in another state held that no federal agency could condemn Indian lands without specific authorization by an act of Congress. The Justice Department — and thereby the Corps — decided to abide by that court decision.

Negotiations proceeded with the help of Tulsa’s congressional delegation: U.S. Sens. David Boren and Don Nickles, and Tulsa-area Reps. James R. Jones and Mike Synar. Ultimately, Boren pledged to withhold his support for building Candy Lake, placing Candy on indefinite hold; and the Osage Council agreed to accept an offer of \$7.2 million (as compared to the \$4.3 million Corps’ offer). By the time the Corps completed subsequent negotiations with 84 individual oil lease operators, the cost of Skiatook mineral rights had risen to nearly \$15 million.<sup>3</sup>



### **1986 OMNIBUS WATER BILL.**

“Ladies and gentlemen,” Col. Patete said dramatically on Nov. 17, 1986, “I am pleased to announce that President Reagan signed the Water Resources Development Act of 1986 at 1:30 p.m. today.”<sup>4</sup>

It was the first omnibus water bill in 16 years, and it was a historic day in more than one respect. For this was a bill that varied, in almost every important aspect, from previous water resources legislation.

In the first place, the bill authorized an amazing array of projects: more than 300 new projects nationwide, at a total cost of around \$16 billion. In the Tulsa District alone, it authorized more than a half-billion dollars in projects. This was not as debilitating to the federal budget as it might sound, for nationwide, the bill deauthorized 293 projects that would have cost about \$11 billion.

In the second place, the bill established a port user fee and increased the inland waterways fuel tax, shifting more of the cost of waterway operations to users.

And in the third place, the bill set into law new cost-sharing partnerships between the Corps and non-federal sponsors such as cities and towns. For the first time in many years, locals would pay major slices of the cost of projects, including studies leading up to the projects. This was the controversial provision that had held up the bill for so many years, with the Reagan Administration insisting that larger shares of the costs be devolved from the federal treasury.

Patete spoke of a new partnership between the Corps and local governments.

"People who gain from the water projects should be willing to invest in the many benefits they receive," he said. "More local involvement will mean a setting of priorities by the users, which will give our projects greater impetus and credibility . . .

"I see an upcoming era full of changes and challenges . . . a new way of doing business — for the Corps and for our sponsors," Patete said. As it turned out, he was more than right in that prediction.<sup>5</sup>



**Left: What some called "The Tulsa Treaty" was signed by city and Corps officials Jan. 22, 1988. The agreement set terms of a historic partnership between the city and the Corps to develop the \$155 million Mingo Creek flood control project. Signing (seated) were Tulsa Mayor Dick Crawford, left, and Assistant Secretary of the Army for Civil Works Robert W. Page, Sr. Looking on, left to right: Tulsa's Stan Williams and J.D. Metcalfe; and the Corps' Lt. Gen. H.J. Hatch, Chief of Engineers; and Brig. Gen. Robert C. Lee, Southwestern Division Commander. Below: Tulsa's Mingo Creek caused \$160 million in damages in 1974, 1976, and 1984 floods.**

## **MINGO CREEK, TULSA.**

The date was January 22, 1988, a Friday; the time, just before noon; the place, the City Hall of Tulsa, one of the most flood-haunted cities in the United States. The drama played out there epitomized Patete's predictions about the new partnership.

The occasion? Leaders of the Corps of Engineers, from Washington to the Tulsa District office, had gathered with city leadership to sign one of the first new cost-sharing agreements in the nation for one of the largest local flood protection projects in the Corps' history.



Mingo is an innocent-looking creek that drains the eastern one-third of the city of Tulsa. But on its frequent flood rampages, Mingo becomes a killer creek that rams through neighborhoods like a wet tornado, as much as a mile wide, with only minutes' warning. Its toll of death and destruction stretches back to early development of the floodplain in the 1950s. Mingo caused \$11 million damage in 1974, \$26 million in 1976, and \$125 million in 1984.

Since 1974 the city and the Corps have worked to develop the most cost-effective plan to reduce Mingo flooding. The \$155-million plan that evolved includes expanded channels and 23 detention basins where flood waters will be captured and stored, then released slowly downstream after the danger of flooding is past.

Under unique legislation, the city of Tulsa has been building portions of the Mingo project, while the planning and negotiations continued. With the authorization from the 1986 federal omnibus water bill and the historic signing of the local cost-sharing agreement in early 1988, the Corps was able to move forward with construction of its first project, beginning in October 1988.

## **SALT OF THE EARTH.**

It was in some ways the cruelest joke of all: Even in the dust-bowl days, water flowed freely down the Arkansas and Red Rivers — but it was laced with salt . . . unusable . . . poisoned, for all practical purposes, by an ancient accident of geology.

Over many years, the Tulsa District has looked for cost-effective — and politically acceptable — solutions to the natural salt pollution of both the Arkansas and Red Rivers.

As the District's first 50 years was drawing to a close, this frustratingly slow endeavor appeared on the brink of at least partial success.

The problem has been traced back in geologic time some 250 million years, when an inland sea covered what is now the Texas Panhandle and western Oklahoma. At some point the sea became isolated and all the water evaporated, leaving salt deposits that eventually were covered with rock and silt.

Now salt from these buried beds bubbles up as springs — salt seeps, as they are called — and is carried by rain runoff to rivers and streams which are salt-laden and nearly useless.<sup>6</sup>



**Above: A salt-encrusted tumbleweed from the Red River valley where workers (right) prepared a test site for the District's experimental chloride control project.**



For example, Lake Texoma every year receives an average of 3.1 million acre-feet of water; because of salt pollution from the Red River, the water is virtually unusable for irrigation or industrial/municipal use.<sup>7</sup>

In 1959, the Corps began study of ten source areas in the Red River basin and five in the Arkansas basin.

The Arkansas part of the study subsequently became mired down in environmental and economic problems.

In 1981, the Arkansas River salt study was shelved in eight volumes prepared under the leadership of project manager David Steele.

On the Red River, however, Tulsa District experiments at two sites proved successful.

The first experiment was at Estelline Springs, about 90 miles southeast of Amarillo in the Texas Panhandle.

An earthen and rock wall traps water that suppresses the spring through hydrostatic pressure. This project was placed in operation in 1966 and over subsequent years has reduced the flow of brine by about 80 percent from Estelline Springs.<sup>8</sup>

A second project, southwest of Wichita Falls, Texas, captures salt brine as it seeps from the ground, then diverts it to safe storage in off-site brine lakes that won't pollute rivers. A low-flow dam collects brine that is pumped and piped 23 miles to Truscott Brine Lake.

The 1986 Omnibus Water Bill exempted the Red River project from new local cost-sharing requirements — on the condition that an independent evaluation of the Truscott site showed it would do what the Corps said it would do.

In August 1988 a five-member evaluation panel, chaired by Utah State University's Dr. Jack Keller, reported that the project topped Corps' projections. The panel said it would remove 87 percent of the chloride seepage over the project's life.

"We . . . recommend that authorization be given to continue with the construction of the Red River Chloride Control Project," Keller wrote.<sup>9</sup>

By 1988, cost of the Red River chloride control project was estimated at \$142 million, of which \$11 million had been spent. The remainder had yet to be approved by Congress, but the success of the Truscott site raised hopes that a fully funded cleanup project would make the Red River potable — useful, at long last, for cities, industries, and farmers.<sup>10</sup>



***As part of the chloride control project, Truscott Brine Lake was dedicated in 1987.***



**Betty Shannon was District Equal Employment Officer for 10 years.**

**MOVIN' UP:  
EQUAL EMPLOYMENT OPPORTUNITY** As in the rest of society, progress for women and minorities has not come automatically in the Tulsa District.

Both the "EEO" — equal employment opportunity — and its companion Federal Women's Program arose from Washington mandates in the 1960s and 1970s. They have wrought profound changes in the District work force.

The numbers of women and minority workers nearly doubled (from 204 to 366) in the decade after 1974, when the programs went into high gear in the District. Even more significant, a high percentage of women and minorities moved from the lowest job ranks into middle or higher professional, technical, and management posts. The changes amount to a veritable revolution.

District EEO programs generally aim to eliminate bias and prejudice toward minorities and women. The program provides increased training opportunities and cultural awareness programs, such as Black Heritage Week and Native American Heritage Week.

One of the most successful programs is called Upward Mobility, which offers special training and promotion options to under-employed workers with high advancement potential.

Woodie McClellan became the District's first fulltime EEO officer in 1974. Betty Shannon assumed the post in 1975 and served for a decade. She was succeeded by Maggie Edwards.

The Federal Women's Program was established in 1967. The first coordinator, Mildred Gowins, was named in 1970, and succeeded in 1976 by Myra Craig, who was given a clear mandate by Col. Driskill "to serve as an advisor and assure that equal opportunity for women is an integral part of the District's overall equal opportunity program." Craig was followed by Jeannette L. Perry, titled FWP manager, in 1979; Beverly Leland in 1980; Norma Bennett in 1981; and Jean Y. Newman in 1982.

**THEY'RE NOT RANGERETTES**

*The first District women park rangers were heralded by a headline: "They're not rangeresses," wrote the Muskogee Phoenix on April 29, 1973.*

*Although the women were working only for the summer, they had full ranger authority and were not second-class rangers, said Operations Chief Ira E. Williams.*

*But some problems arose over finding appropriate uniforms. So the District employed "a talented dressmaker" who "whipped up an outfit, in traditional forest green, consisting of a three-quarter-length coat with top stitching detail, skirt, slacks, and a snappy little short-brimmed cap with the Corps castle insignia," according to a District press release.*

*With luck, the headline on the press release will be quickly forgotten: "Pulchritude Added to Corps' Park Ranger Program."*



**Women's ranger uniforms have ranged from mini skirts, right, to the recently added maternity model.**



## WORKING MODEL

**A** working model of Tulsa District Upward Mobility is Paula Perkins, here modeling her native costume for American Indian Day 1988. In nine years with the District, Perkins has worked her way up from secretary to writer/editor in the Planning Division. She won the District's 1985 Woman of the Year Award and a 1985 Federal Employee of the Year Award for the Tulsa region.



Paula Perkins



**Jim Laster welcomed University of Tulsa Basketball Coach Nolan Richardson, guest speaker at the Federal Women's Program 1983 seminar.**



**EEO programs over the years have lent special emphasis to American Indian, Black, Hispanic, and women's concerns. Among participants: left: Abel Cordova, Gloria Lough, and Juanita Morrow; bottom left: Shirley Rolison; right: Doris Brooks, Jean Newman, and Maggie Edwards (EEO officer); and bottom right: Sandie Glass.**



## **RACKING UP SAVINGS.**

The search for excellence took a giant step forward in December 1984 when the Tulsa District was designated a Corps' "model district" to test innovative management techniques. The concept was adapted by Robert A. Stone, a Deputy Assistant Secretary of Defense, from *In Search of Excellence*.

The program launches a counter-offensive against bureaucracy. It allows managers to improve efficiency through decentralizing management, identifying bad or counterproductive rules or regulations, and implementing better methods of operation.

At its heart, the model district program encourages all employees to identify better ways to do the Corps' job and put those ideas on the table for discussion. Financial savings are shared with the employees. But it is more than an employee suggestion program, because nothing is sacred; anything can be challenged. And anyone in the chain of command above the District Engineer can say yes to the ideas, but few have authority to say no.

Three years into the program, Tulsa District employees had submitted 2,000 ideas. Five hundred had been adopted — and tangible savings had been measured at \$1.2 million.

Another Corps endeavor racking up savings in the Tulsa District was "value engineering," a program established in the 1960s to find more economical ways to build projects without sacrificing functional integrity. By 1988, the Tulsa District had logged nearly \$50 million saved through value engineering and in savings on a wide spectrum of jobs and projects throughout the district.

### **THE INFORMATION REVOLUTION**

*He who possesses accurate, accessible information can rule the world — but the information glut has stopped more than one bureaucracy dead in its tracks.*

*The Tulsa District works constantly to streamline information systems.*

*One example: the ISP (information systems planning) study conducted between November 1984 and April 1985. The ISP Team, of managers from all parts of the district, was headed by Lt. Col. David L. Wooden, team chief, and Maj. Sonny Bryant, deputy team chief.*

*Members included Don Henderson, Pat Clark, A.W. Gibson, Claude Marshall, Charles Pearre, David Steele, Larry Redford, and recorder Tamra Moreno.*

*The study determined what information is available, who creates it, and who uses it. The team developed a streamlined information management plan to reduce waste, cut costs, and improve efficiency.*



**Don Henderson**



## Chapter 5

### EPILOGUE:

# FIFTY YEARS OLD AND STILL GOIN' STRONG

The visiting high school students could have found no better tour guide than Col. Frank M. Patete. Here was a born communicator, a showman at heart, to lead them through the maze of his realm of government. And his realm was epitomized by the Tulsa District of the U.S. Army Corps of Engineers.

Fall, 1988. Come and walk with the good Colonel through the echoing halls of the Engineers on a tour that might have been. Along the way, we'll collect snapshots of today's Tulsa District: vigorous and active, aging gracefully.<sup>1</sup>

"This is what we're about," Patete told the attentive visitors. "We're 50 years old and still goin' strong."

The aged patina of the old federal building, with its marble, mahogany, and brass, took on a special shine in the morning sun. Patete, in Army greens, led the group into the lobby where he pointed to maps of the District, circa 1988.

"There's a rumor that this staircase is haunted," the Colonel said with a twinkle, pointing to the graceful stairs that rise majestically from the lobby of the 70-year-old building.

"The legend — and I don't believe it, mind you — is that the ghost of the first Tulsa District planner haunts this building, and that he hangs around to keep checking up on how well we're carrying out his dreams . . ."

Patete grinned, then waved his arm with more serious determination toward the District map.

"Today," he said, "we have jurisdiction over the entire state of Oklahoma and portions of Kansas and Texas. We work with programs that begin with flood control and range from fish farming to lakeshore management to inland waterways — including hydropower, the navigation system, operations and maintenance for 37 projects, comprehensive planning studies."

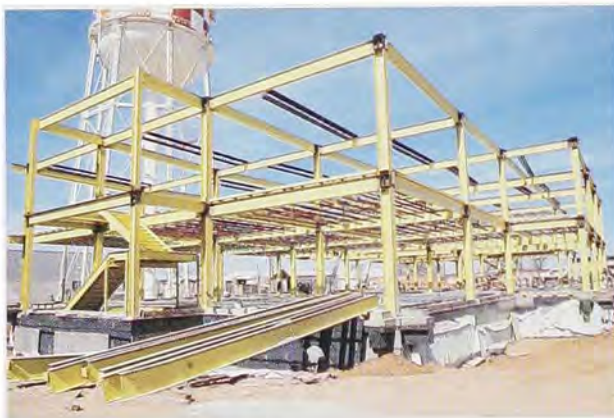
## CATFISH FARMING

**A** new industry in the making? Maybe. About 250,000 six- to eight-inch fingerling catfish formed the first crop "planted" in an experimental fish farm at Lake Texoma in May 1987. The idea: test whether the popular channel catfish can be raised commercially in large net pens suspended in area lakes. RedArk Development Authority and several federal agencies, including the Corps of Engineers, are sponsoring the three-year experiment. RedArk hopes to boost the southeast Oklahoma economy with water resources development. Initial fish farming results are successful.





**Tulsa District military mission includes construction and building maintenance at Pantex Plant, where top photo shows workers constructing blast walls on a high explosive subassembly area. Pantex, near Amarillo, is the only U.S. plant for final assembly of nuclear weapons. Among other projects: construction at Vance Air Force Base mission support facility, left, and many new recruiting stations, far left. Below: Major Hubbard.**



## **MILITARY SUPPORT.**

Moving into a crowded office, Patete introduced the group to Maj. Jon Hubbard, deputy commander for military work, who was meeting with Executive Assistant Larry Redford. The topic was military support.

"We are, in essence, builders, architects, and maintenance engineers for military installations in Oklahoma and Texas," Hubbard said. "We serve one Department of Energy installation, the highly sophisticated Pantex nuclear weapons assembly plant at Amarillo, Texas. And we serve two Army installations, five Air Force installations, eight reserve commands, and 104 recruiting stations."

The work runs the gamut from building complex mission support facilities at Vance Air Force Base to leasing space for military recruiting offices throughout the region, Redford said.

"In fact," Patete said, "in dollar terms, our military work now out-distances our civil work. Our 1989 budget allocates \$100.7 million for Tulsa District's military work and \$85.2 million for our civil work — making our total budget for this year more than \$186 million.

"To do that work, we have a work force that has remained fairly steady over the years. Today, we have about 1,300 employees, about one-half in this Tulsa District office and about one-half in the field. We are proud that 83 percent of our engineers are registered professionals."



## ENGINEERING

## AND CONSTRUCTION.

At the next stop, Patete introduced Frank Parker, head of the District's new Engineering and Construction Division.

"At the beginning of fiscal 1988, we combined our engineering and construction programs into one, for a two-year test that includes new experiments with centralized, life-cycle project management," Parker said. "We are proud to see many Tulsa District ideas adopted for use throughout the Corps through a program called Initiative 88."

Among projects under current planning, design, engineering, or construction are

- Building the \$80 million Reynolds Army Hospital at Fort Sill.
- Completing flood control work on Tulsa's \$155-million Mingo Creek project.
- Designing Parker Lake, a new source of water supply for Southeastern Oklahoma.
- Constructing Douglass Lake for flood control, water supply, and recreation in southeast Kansas.
- Providing flood control projects at Great Bend, Kansas, and Wichita Falls, Texas.
- Designing and building a highly technical and intricate aircraft turbine blade repair facility at Tinker Air Force Base.
- Developing hydropower at Mayo Lock and Dam.

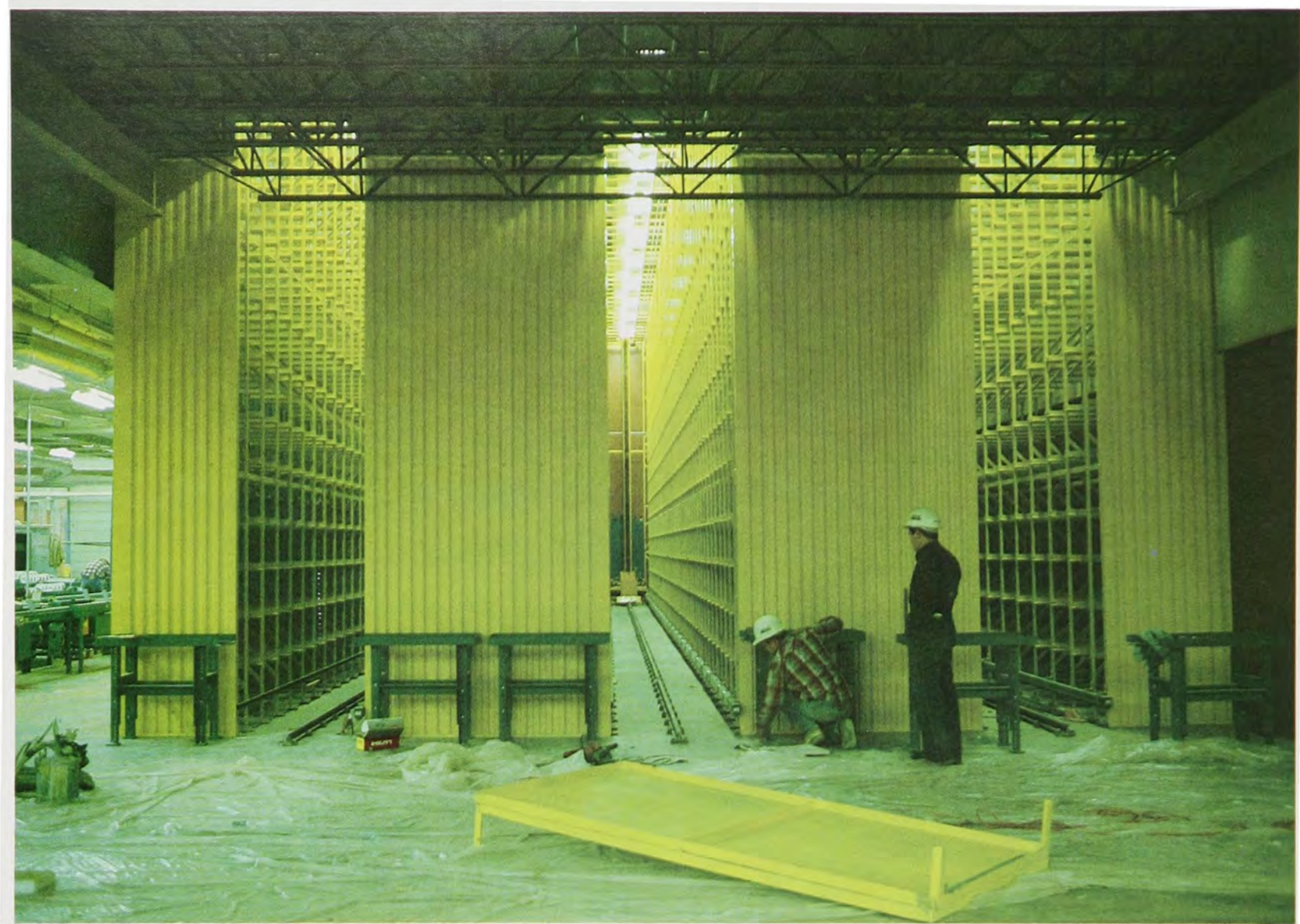
"The Cherokee Indian Nation will design and construct the power facilities, and Tulsa District will oversee construction and operate the completed project," Parker said.



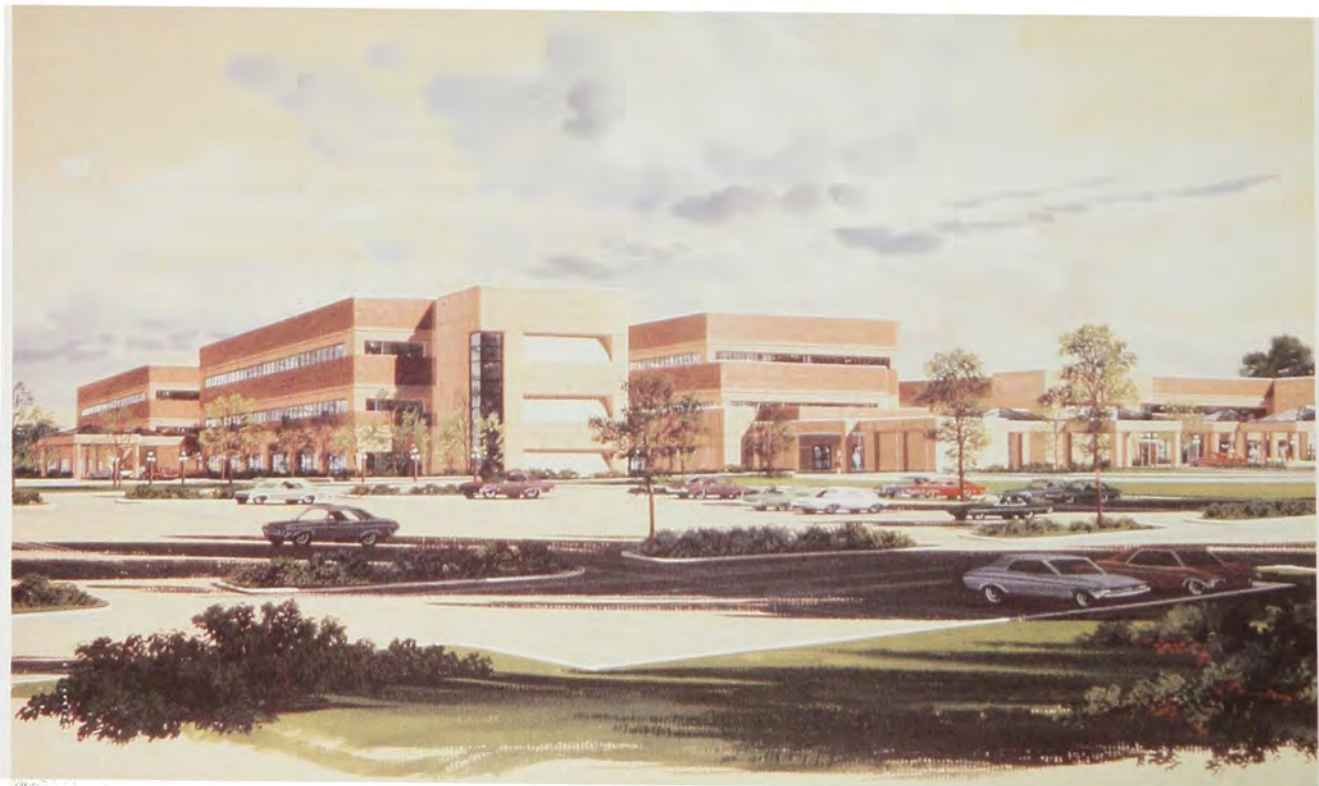
**Frank Parker**



**The Tulsa District's Engineering and Construction Division works on a wide variety of projects such as: top left, Tulsa's Mingo Creek Flood Control Project; and, bottom left, the Great Bend, Kansas, Local Flood Protection Project.**



**Top photo: The Tulsa District took the lead in designing and building the highly technical and intricate aircraft turbine blade repair facility at Tinker Air Force Base. Bottom photo shows architect's rendering of the \$80 million Reynolds Army Hospital under construction at Fort Sill.**



“Work is wrapping up on Sardis, Arcadia, Copan, and El Dorado Lakes,” Patete said. “And we are completing work at Truscott Lake — a reservoir to contain salt brine that’s part of the exciting project to reduce natural salt pollution in the Red River.”

In addition, special facilities at Tinker Air Force Base will provide depot-level maintenance for the Navy’s E-6A aircraft and the Air Force’s recently unveiled Stealth Bomber.

“Our environmental engineers have assumed responsibility for Department of Defense environmental cleanup and protection at military establishments throughout this district,” Parker said. “And we will be doing similar work for the Environmental Protection Agency at ‘Superfund’ sites throughout the entire multi-state Southwest Division.”

## **PLANNING**

**AND REAL ESTATE.** “Planning has always been the life-blood of this district,” said Bob Brown, Deputy District Engineer for Civil Works/Project Management. The tour had moved to the sleek Williams Tower offices across the street from the old federal building, into the Planning Division that Brown headed for a number of years.

“The District has a number of active investigations going on now, including flood control studies, review of existing projects, and planning assistance to state governments in Oklahoma, Kansas, and Texas,” Brown said.

“Our current planning studies range from small projects such as flood improvements on Joe Creek in Tulsa to two broad water-resource investigations: the Red River Basin Comprehensive Study and the South-Central and Southeast Oklahoma Comprehensive Study. Those two studies focus on ways to provide jobs and development in economically depressed areas with water resource projects.”

“One of our most valuable programs is called Flood Plain Management,” said David Steele, Acting Chief of Planning.

“We respond to more than 13,000 requests each year for information about flood hazards at specific locations.”

“One of the biggest jobs in this District, today and throughout our history, has been performed by the Real Estate Division,” Patete said. “We acquire, manage, and dispose of real estate,” he said. “Another Real Estate job is coordinating with our local cost-sharing partners.

“We administer more than a million acres, about one-half in land area and the other half water-surface.”



**Above, Bob Brown. Below: Strayhorn Landing, Tenkiller. Lakeshore management programs throughout the District provide services for thousands of visitors to area lakes.**



**As life becomes ever more complex, needs increase for recreation programs such as those provided by the Tulsa District projects. Above, clockwise from upper left: Boy Scouts enjoy an interpretative program on the Jean Pierre Chouteau Trail. Picnickers take advantage of park areas at Tenkiller. Fishing can be done from wheelchairs, too. And muzzle loaders hunt the hard way at Texoma. Below: J. Pat Clark.**

**OPERATIONS GETTING BIGGER.**

“As gigantic as our construction program has been, our operations work is becoming a bigger job every year,” Patete said. He introduced J. Pat Clark, head of the District’s far-flung Operations Division.

“Where shall I begin?” Clark said. “In Operations Division, we provide maintenance and operations, recreation, and regulatory services. Operations includes more than 50 field offices. These field people are our most important ambassadors, our front-line contact with the public.”

“Thirty-three of our lakes provide flood control,” Patete said, “and the District’s Reservoir Control Section oversees flood control operations of eight Bureau of Reclamation and two Grand River Dam Authority lakes. These projects are operated in conjunction with 20 Corps local flood protection projects. Altogether, these projects have prevented nearly \$2 billion in flood damages — an amazing record.”

“Navigation is more and more important to our region,” Clark said. “More than 3.5 million tons of major commodities were shipped on the Oklahoma portion of the McClellan-Kerr Arkansas River Waterway last year,” he said. “We operate five of the locks and dams, which provide a lift of over 140 feet.

“Our most visible work, of course, is recreation, which is included at all our 37 projects — the largest recreation program in the Corps. Visitors spent more than 500 million hours at our projects during 1987.

“At schools, fairs, and the like, our managers present programs ranging from water safety to bird identification and hunter safety. They also maintain a free-loan audio-visual library for public use:

“Much of our project land is devoted to wildlife management. Half of it is managed by the Corps, but the other half is operated under license to state and other federal agencies.”

Twenty-nine of the lakes provide water supply, and 13 include storage to improve water quality,



he said. Hydropower is produced at eight projects. Another important element of the program is regulation, including control of dredging and filling of navigable streams, that helps the Corps maintain the integrity of its projects.

The group moves back toward the lobby, past the highly secured Emergency Operations Center, which Emergency Management Chief Bill Horry keeps prepared to function in case of military mobilization or civil crisis.

"In the event of an emergency, we move into highest gear to help with tornadoes, floods — and even droughts," Horry explained.

**THE GHOST OF PLANNERS PAST.** "It looks like we're running out of time," Patete said, drawing the tour to a close.

"I have really enjoyed visiting with you today and talking about my favorite subject: the Tulsa District of the U.S. Army Corps of Engineers.

"In closing, let me just say that the employees of the Tulsa District are a stalwart lot who have kept this program moving forward for the past 50 years, through war and peace, good times and bad, prosperity and every imaginable adversity.

"The impact of their work on this region is incalculable.

"And I believe they will be here when I am long gone, still moving forward, still carrying out visions — under the watchful ghost of that first Tulsa District planner and all his successors — still embracing dreams for better lives for all the people of this region and this great nation and, in fact, the world."

The lobby was awash in sunlight as Patete said a crisp military good-bye to his guests and walked smartly upstairs.

Behind him on the grand marble staircase, only a dreamer would have discerned a pale shadow, moving with a ghostly air from yesterday, through today, into tomorrow . . . with a faint smile . . .



**Where do we find ourselves?  
... we wake and find ourselves on a stair;  
there are stairs below us, which we seem to have ascended;  
there are stairs above us, many a one,  
which go upward and out of sight . . .**

**— Emerson**

# APPENDIX

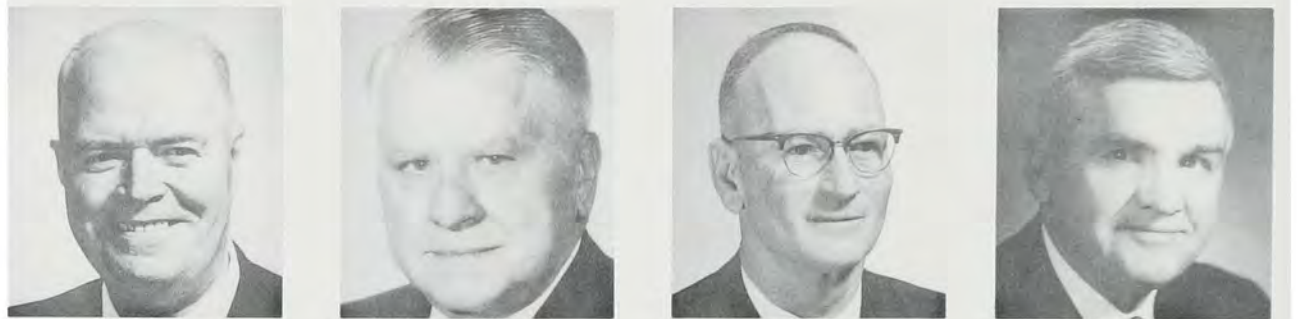
## GALLERY OF DISTINGUISHED EMPLOYEES

The Gallery honors those who have demonstrated exceptional professional competence through dedicated federal service in the Tulsa District.



*From left to right:*

**Erling A. Cornell, 1979,  
Melvin W. Parse\*, 1979,  
Webster L. Boland, 1979,  
Clarence E. Guthrie, 1979**



**Robert F. Hunter, 1979,  
Rhea W. Stringer, 1979,  
Myron DeGeer, 1979,  
David A. Helms, 1979**



**Kenneth W. Fielder, 1980,  
Ira Williams, 1980,  
Raymond L. Broyles, 1981,  
A. Morris Smith, 1981**



**Letha C. Davis, 1981,  
George E. Fox, 1982,  
A.B. Bastos, 1982,  
George E. Sheppard, 1982**



**Marvin G. Johnson, 1983,  
John C. Maples\*\*, 1983,  
Alan W. Geismer\*\*, 1985,  
Wayne J. Ferguson\*\*, 1987**

**\* Also a Colonizer**

**\*\* Department of Army  
Meritorious Civil Service  
Award**

## **COLONIZERS**

The Colonizers Club was formed on Engineer Day 1963, almost 24 years after the Tulsa District opened. Members included the 49 employees, still remaining on duty, of the District's original 275 civilians and three officers:

Clarence H. Anderson  
John H. Barrett  
Antonio B. Bastos  
Webster L. Boland  
Glenn M. Bowman  
John W. Brown  
Don Butcher  
Maude Byrne  
Norman H. Chaffee  
Harold W. Chandler  
Noah F. Childress  
Mervin Clements  
John C. Darbro  
James F. Dean  
George Durscheri  
William T. Finley  
Charles R. Flanery  
Walter L. Fletcher  
John D. Freeman  
Philip F. Goodman  
Charlie C. Goodwin  
Joe Gregory  
Donovan P. Grosshans  
Roland M. Hass  
Wm. A. Hollingsworth

Frank A. Johnson  
Frank W. Johnson  
Joseph L. Lemer  
William Lemmon  
Lawrence Martin  
Hillis Mayes  
Thomas Mayes  
George A. McClaskey  
Charles J. McQuade  
Lyal O. Mikelson  
Lloyd Moore  
Richard N. Palmer  
Melvin W. Parse  
Lena Pasink  
Ira Patterson  
Claud L. Pratt  
Russell E. Richardson  
Lloyd K. Schulteis  
Henry K. Shane  
George Shepherd  
Robert M. Sutter  
Joel J. West  
John A. Whipple  
Harold Williams

## **MERITORIOUS CIVIL SERVICE AWARD**

A.B. Bastos, March 1964  
Edith B. Shelton, March 1968  
Raymond L. Broyles, January 1971  
Myron DeGeer, January 1971  
Ira E. Williams, June 1976  
Allen W. Geismar, February 1977  
Wayne J. Ferguson, October 1977  
Joseph L. Jones, June 1978  
John C. Maples, July 1978  
Jack Shields, April 1979  
Harlan M. Steele, December 1979  
Charles V. Steed, April 1980  
Curtis E. Weddle Jr., May 1981  
Cliff N. Hayes, June 1985

## **LT. MARK FRITZ LEADERSHIP AWARD**

Donald R. Henderson, 1985  
Thomas W. Logsdon, 1986  
Curtis F. Weddle, Jr., 1987  
LTC David L. Wooden, 1988

## **EMPLOYEE OF THE YEAR**

Maryella Goins, 1979  
Beverly K. Leland, 1980  
Caroline R. Parks, 1981  
Arthur Burkart, 1982  
Jake W. Gage, 1983  
Richard G. Hunter, 1984  
Steven R. Cone, 1985  
Carolyn K. Shultz, 1986  
Earl D. Groves, 1987  
David L. Combs, 1988  
Ruth L. Brown, 1988

## **ENGINEER OF THE YEAR**

G. David Steele, 1980  
H. Dale Reynolds, 1981  
Ronald L. Barker, 1982  
Ralphart R. Hight, 1983  
Jimmy C. Jackson, 1984  
Brenda K. Kinkel, 1985  
John H. Roberts, 1986  
Charles W. Pratt, 1987  
John D. Hill, 1988

## **RANGER OF THE YEAR**

Jeff London, 1976  
Rick Sellers, 1977  
Harry Duncan, 1978  
J.D. "Pat" Patterson, 1979  
Arlyn Hendricks, 1980  
Terry Holt, 1981  
Preston Hunter, 1982  
Lanell Trower, 1983  
Michael P. Schrick, 1984  
James Holder, 1985  
Everett E. Laney, 1986  
R. Eugene Goff, 1987

## **FEDERAL WOMEN'S PROGRAM MANAGERS**

Mildred C. Gowins, 1970  
Myra Craig, 1974  
Jeanette Perry, 1979  
Beverly Leland, 1980  
Norma Jean Bennett, 1981  
Jean Newman, 1982

## **WOMAN OF THE YEAR**

Myra J. Craig, 1976  
Beth U. Holland, 1978  
Jean Anderson, 1979  
Donna S. Pinkey, 1980  
Bobbie L. Harmon, 1981  
Pamela J. Kelly, 1982  
Beverly K. Leland, 1983  
Jeweldean Stigall, 1984  
Paula R. Perkins, 1985  
Hyla J. Head, 1986  
Wanda F. Marr, 1987  
Karla G. Fleming, 1988

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UNDATED:

— Johnnie Davis, Jet, Oklahoma. Untitled report on Carl Joseph Shelton, who searched for buried gold treasure on the site that became Great Salt Plains Dam.

— "History of the U.S. Army Engineer District, Tulsa."

— "Dates of Tulsa Post Office Building," information excerpt for Tulsa Magazine Article.

— Photo map showing outline of Tulsa District, "A Model District."

— "There is a castle in your past series."

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