KANSAS CITY DISTRICT'S NEWS MAGAZINE

HEARTLAND ENGINEER

www.nwk.usace.army.mil

FEBRUARY 2018

the Missouri River Edition

INSIDE THE HEARTLAND

The U.S. Army Corps of Engineers, Kansas City District's Public Affairs Office works to keep the public informed on project updates, milestones and district missions. One component of information is an online presence to include social media platforms.

The Public Affairs Office maintains a presence on **Facebook, Twitter and YouTube**. To learn more about the Kansas City District, its missions and its team, find and follow us online!

www.nwk.usace.army.mil
www.facebook.com/usace.kcd
www.twitter.com/KC_USACE
www.youtube.com/KansasCityUSACE

The **HEARTLAND ENGINEER** is an authorized publication for members of the Kansas City District of the U. S. Army Corps of Engineers. Contents are not necessarily official views of, or endorsed by, the U.S. government, the Department of Defense, Department of the Army or the U.S. Army Corps of Engineers. It is published using Adobe InDesign CS6 and Photoshop using photo-offset reproduction by the district. All editorial content of the **HEARTLAND ENGINEER** is prepared, edited, provided and approved by the district public affairs office.

COMMANDER Col. Douglas B. Guttormsen
DEPUTY COMMANDER Lt. Col. Brent L. Legreid
P.A. CHIEF David S. Kolarik
EDITOR Trisha C. Dorsey
WRITER James F. Lowe
DESIGNER Rusty Thomas

HEARTLAND ENGINEER

FEBRUARY 2018

Richard Bolling Federal Building
601 East 12th Street
Kansas City, MO 64106
Phone (816) 389-3486
Fax (816) 389-3434
CENWK-PA@usace.army.mil

ON THE COVER: Historical Missouri River photos, owned or taken, by the U.S. Army Corps of Engineers. Throughout the 20th Century, the Kansas City District has channelized, constructed and maintained hundreds of miles of levees along the Missouri River and its tributaries. Today, the district continues to maintain and manage these structures while balancing river interests and authorities.

Col. Douglas Guttormsen

Greetings and Happy New Year to all. I'm eager to roll out this edition of the Heartland Engineer as we have taken a new approach on how we communicate with this media. Historically this magazine was produced and distributed as an internal district forum to communicate most specifically to district employees. We have retooled the magazine to appeal to both district members and those we work with on a regular basis through projects or mutual interests.

This edition will serve as our annual Missouri River edition. By broadening the audience and focusing the edition's subject matter, I'm hopeful that we will better communicate relevant information in a more collaborative fashion. Our Public Affairs Office has reached out to many of our stakeholders to not only share "The Heartland Engineer" but to be involved by way of contributing to the content of the magazine.

The river's importance to the region is indisputable and its purposes are wide-ranging. This edition will look at many aspects of the river. We'll touch on river history, outreach along district managed rivers, important information as it relates to navigation season, flood fight and risk management preparation, Silver Jackets state-led hazard mitigation efforts, water management operations, dam and levee safety, Missouri River Management Plan updates and the St. Joseph, Mo. levee project.

My hope is that through this medium, all truly interested players have a vehicle to share successes, concerns and ideas as to how the Kansas City District and our stakeholders move forward on shared interests in an open and transparent forum.

In addition to the approximately 500 miles of the Missouri River the Kansas City District manages, we are responsible for 18 lake projects throughout the region that serve many important purposes. One of those purposes is recreation. Annual visitation to our projects averages approximately 15 million citizens. Because recreation affects so many people, the next edition of the Heartland Engineer will focus on Recreation.

Let me conclude by saying thank you all those who shared information and contributed to this edition. Your insights and feedback are extremely important in shaping the way we conduct business in the Kansas City District.

Historically Taming the Mighty Mo

Throughout the 20th Century, the Kansas City District has channelized, constructed and maintained hundreds of miles of levees along the Missouri River and its tributaries. Today, the district continues to maintain and manage these structures while balancing river interests and authorities.

Established in 1907, the most pressing need for the Kansas City District was to continue to improve navigation on the sprawling and constantly changing Missouri River.

In 1910, Congress authorized $1 million in funding to create a permanent six-foot navigable channel between Kansas City and St. Louis, Missouri, as well as an additional $300,000 for channel modifications between Kansas City and Fort Benton, Montana.

One effective process the Corps used to deepen the channel was by building dikes that would slow and filter the water, but not block its flow. Mattresses of willow branches were woven together that would help trap the sediment flowing downstream. After a couple of years the sediment buildup would form man made sandbars. These sandbars could then protect the bank from erosion, turn the current in a certain direction, and help in the narrowing of the channel. Ultimately, the sandbars could create a swifter current that would carve the bottom of the channel into a navigable depth.

The next decade brought the challenge of meeting the needs of local river interests during a

time when national interests were opposed to further development of the river, in part because of the need to reallocate resources in support of World War I. By 1921, only a little over a third of the original plan for a six-foot navigable channel was complete, and the improved areas downstream of Kansas City could only report a low water depth of four and a half feet.

In 1923, Congress appropriated $1.2 million in improvements and work resumed on the river, but the limited funds only allowed for repairs to existing revetments and progress was slow.

In 1925, as a sign of increasing federal interests in water resources development, Congress ordered a study of options of combing navigation, hydropower, flood control and irrigation works. Agencies responded with 308 reports. The results from these studies would ultimately serve as the basis for the Kansas City District's plan for development of the entire Missouri River basin for years to come.

The Missouri River Navigation Association was established in 1925 and Herbert Hoover (then Secretary of Commerce) expressed his vision of a nine-foot deep navigable channel in the Heartland, with further improvements extending upstream to Sioux City, Iowa.

In 1926, Congress agreed to a revised version of Hoover's plan and appropriated $12 million for the project. Channeling the river would resume again with many of the same methods originally proposed by the Corps in the late 1800s. Structures would be built to guide the current and trap silt, forcing the river to carve out its own channel.

In the early 1930s, President Roosevelt's New Deal and the subsequent National (Industrial) Recovery Act provided job opportunities to unemployed workers and work on the river began again. This time the economic relief allowed the district to expand the regional client base and focus on flood protection in areas adjacent to the river. It was estimated at the time that over two million acres of urban and rural land were susceptible to devastating floods, at the expense of $4.5 million annually.

Protection from flooding as a mission for the district gained even more momentum in 1933, when the district released the 308 Plan which presented an extensive study of the entire Missouri River Basin, taking into consideration how flood control measures could be effectively combined with other water resource developments like navigation, irrigation and hydropower.

This plan recommended a system of reservoirs and levees to protect local communities during flood conditions. It called for continued work on the six-foot navigable channel, extending it from Sioux City to Kansas City, as well as expanding the existing project to create a nine-foot navigable channel from Kansas City to the mouth. The plan also proposed the first dam for flood control at Fort Peck, Montana (which was part of the Kansas City District at that time). Additionally, a reservoir near Topeka, Kansas was recommended to supplement Fort Peck and control flooding on the Kansas River. And finally, the plan called for development and construction of a reservoir system on the Upper Missouri River that would use water for power and navigation.

In 1943, flooding turned attention to flood control plans. Through the Missouri River Division, the Corps submitted the Pick Plan, which merged with the Bureau of Reclamation's Sloan Plan. The resulting Pick-Sloan Plan was approved as part of the Flood Control Act of 1944, and provided for eventual construction of 316 project units, with 112 dams capable of storing 107 million acre-feet of water and generating up to 2.6 million kilowatts of hydroelectric power. It also called for hundreds of miles of levees and flood protection structures. The 1945 River and Harbors Act allowed for a nine-foot navigation channel downstream from Sioux City.

Today, the U.S. Army Corps of Engineers continues to manage and maintain the Missouri River and its structures while balancing the eight congressionally authorized purposes and communicating and collaborating with stakeholders.

Navigating and maintaining the river

By Trisha Dorsey

Navigation is one of the eight authorized purposes of the Missouri River that mandates the Corps of Engineers to manage the navigation channel between Sioux City, Iowa and St. Louis, Missouri. The Rivers and Harbors Act of 1945 calls for a 9-foot deep and minimum 300-foot wide channel.

Today, the focus of the Corps of Engineers navigation mission is to provide a safe, reliable, efficient and environmentally sustainable waterborne transportation system for movement of commerce, national security needs and recreation. In order to meet this mission, the Corps focuses on repairs to river structures from damage such as ice, debris, scouring and high water velocity.

While several sections of the Kansas City District play a role in the navigation mission on the Missouri River, the Missouri River Area Office and River Engineering Section ensure the primary needs of the navigation stakeholders are met.

The Missouri River Area Office, located in Napoleon, Missouri, performs operation and maintenance functions or oversees contracts for small river construction projects. A survey crew inspects the channel depth during navigation flow support season and responds to requests or concerns regarding depth or passability. That office works hand-in-hand with the River Engineering Section located in Kansas City, Missouri, responsible for inspecting and identifying structures which may require repairs, modification or development of a new structure.

During winter months, the River Engineering Section conducts low water inspections to identify what maintenance actions may need to be addressed along the river. Members of the crew note any structures that may be deficient and place them on a list to prioritize and schedule for repair.

To better help the Corps with this process, our

Geographic Information Systems section and river engineering have teamed up to modernize the 1994 Missouri River Hydrographic Survey books to newer Missouri River Bank Stabilization and Navigation Project maps, complete with GIS layers. This new mapping standard should help improve with efficiency of inspections and reports.

"This is a major tool we use to both inspect and schedule maintenance," said Mike Chapman, chief of river engineering. "The Corps has added and modified river structures since the 1994 data, so these updates now show the full inventory in GIS and can help us report project conditions better than before. These tell us the structure type, elevation, length and more."

To better communicate with navigation stakeholders, the Missouri River Area Office distributes daily boat reports via email when traffic is on the river. Information is also shared frequently on the Missouri River Navigation Facebook page. Additionally, the Corps of Engineers, Northwestern Division hosts an annual navigation meeting to bring stakeholders and federal agencies together from all over the basin to discuss relevant topics and the outlook for the upcoming season.

"We are also working on a contract framework to shorten procurement time immensely for maintenance to structures," said James Rudy, Missouri River Area Office operations project manager. "And looking ahead, if weather predictions are correct, we expect full flow support this year."

Safety is always important on the river. Understand the conditions around you and always remember to wear a life jacket.

Learn more about the Corps of Engineers navigation mission online.

http://www.nwk.usace.army.mil/Missions/Civil-Works/Navigation
https://www.facebook.com/MORiverNavigation

Water Management:
An overview of Osage River Basin operations and rainfall events at Harry S. Truman Reservoir

By James F. Lowe

Runoff in the Missouri River basin was slightly above average in 2017. Increased releases through the fall has allowed the reservoirs to have all flood storage capability ready for the beginning of the 2018 runoff season. Water management teams help guide the decision making process that prepares our system to handle the unexpected. The coordination through the Northwestern Division, U.S. Army Corps of Engineers in setting releases and storage at the main stem dams in the northern portion of the basin, sets the conditions for our reservoir system on the tributaries that feed into the Missouri River.

Important items to remember to consider how USACE and the Kansas City District conduct water management:

- Release decisions are never arbitrary in size and never randomly timed.
- Flood control operations are based on water on the ground.
- Flood control releases are allowed to increase as reservoir pool elevation increases.
- Water Control Manuals provide guidance for flood control releases, balancing the risk of storing water in the reservoir and wisely utilizing the space available in the receiving river system downstream.
- Flood control releases follow rules established for each reservoir, the magnitude and timing of which depend upon timely analysis of lake and river data.
- Water Management schedules releases from flood control storage based on current pool elevation and flows/levels at the downstream target (control point) gage location.

In reference to Truman Lake:

- Authorized operating purposes in the Osage Basin include; flood control, hydropower, water supply, water quality, recreation, and fish and wildlife.
- Truman Lake provides approximately four million acre feet of flood control storage, over 70 percent of the basin's combined flood control storage.
- A memorandum of agreement between the Corps and Ameren outlines release coordination from Truman Lake.
- The Corps does not operate Truman Lake to maintain the Lake of the Ozarks at its normal pool elevation.

Chris Purzer, the Kansas City District chief of Water Management, remembered an example from recent history that helps illustrate the flood-risk management operations. In December of 2015 and January 2016, south central Missouri and parts of Arkansas received 4 to 7 inches of concentrated rain. "Truman, Stockton, and Pomme de Terre lakes, all part of the Osage basin were filling with rain and runoff. Many of the district leadership were still out on leave. But, our experienced water management technicians were alert and responsive to changing conditions and coordinated with local and state leaders and shut down releases from Truman. This action stored flood waters and kept it from inundating communities on the Missouri River below Herman," said Purzer.

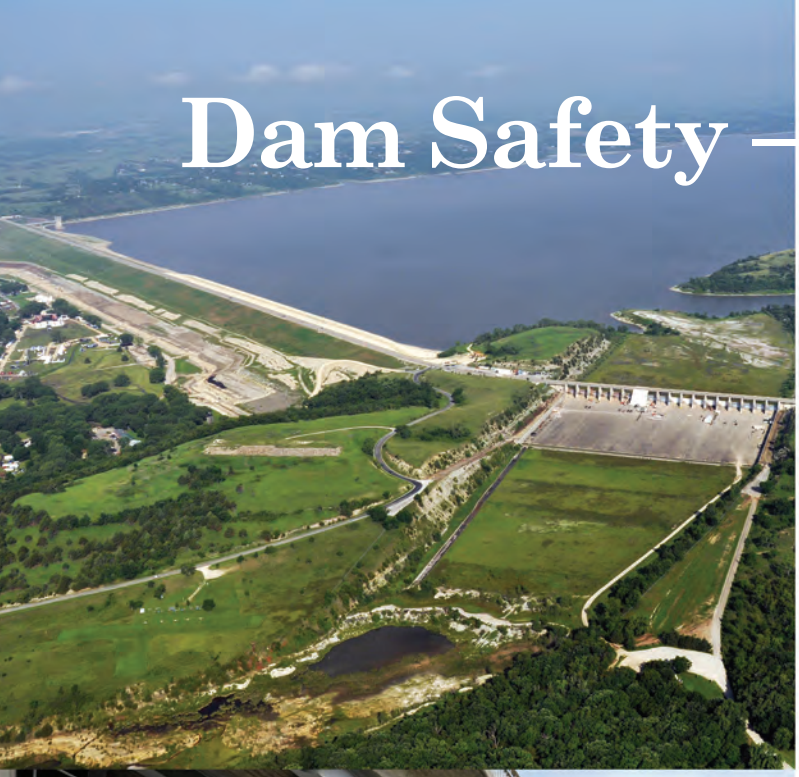
John Remus, chief of the Missouri River Basin Water Management office for the Northwestern Division, who leads the control of the main stem reservoirs north of the district's area of operations, called out the partnership relationship with our district. Data collection and data analysis helps the coordination of oversight to water management. "Both the Omaha District and the Kansas City District have been instrumental in updating the water control manuals and emphasizing consistency across the Missouri River basin. Their management of the tributary reservoirs is key to that consistency," said Remus.

A partner with Kansas City Water, Nate Westup, referred to the working relationship with the Kansas City District, "We have contracts with the District for water storage in seven reservoirs: Clinton, Perry, Tuttle Creek, Kanopolis, Hillsdale, Pomona and Melvern lakes in Kansas. These contracts are essential to meeting our monthly water supply demands." "When there is a need to address a change in operations, I'm 100 percent confident the Corps water management personnel [including the Tulsa District] would be available weekends, evening and holidays," said Westup summarizing his high regard for the team work between the partners.

Did You Know?

- It is believed that the Missouri River formed about 30 million years ago, but because over time, it changes its course, the current course of the Missouri is estimated at 115,000 years old.
- The Kansas City District was formed in 1907 to explore the feasibility of improving navigation on the Missouri River.
- The Missouri River is the longest river in North America and is approximately 2,341 miles long.
- The Kansas City District manages 500 miles of the Missouri River from Rulo, Nebraska to the confluence of the Mississippi River near St. Louis, Missouri.
- The Missouri River drainage area is approximately 529,000 square miles, one-sixth of the entire United States and the basin is home to about 10 million people from 29 Native American Tribes, 10 states, and a small part of Canada.
- The Kansas City District operates 18 lake projects and dams throughout its area of responsibility of nearly 165,000 square miles.
- The Missouri River flows through several states including Montana, North Dakota, and South Dakota. It flows past Iowa, Nebraska, Missouri, and Kansas.
- The Kansas City District is a full-service district and provides, Civil Works, Emergency Management, Military Construction and Environmental services for those we serve.
- The name 'Missouri' is derived from the Missouri tribe name, meaning 'people with wooden canoes' and the Missouri has the nickname "Big Muddy," because of the large amount of sediment that it carries.
- The Kansas City District employs approximately 850 professionals and is proudly named the "Heartland Engineers"
- During the 20th century, the Missouri River basin was extensively developed for irrigation, flood control and the generation of hydroelectric power.

Dam Safety – always important, requires many eyes and minds



By James F. Lowe

Imagine being far back in time and a reservoir dam upstream from your river town failing. . .

The South Fork Dam failure occurred on May 31, 1889 in Johnstown, Penn., and caused 2,209 fatalities and became known as the "Johnstown Flood". The privately managed dam failed during a historic flooding event and serves as the poignant reminder of why dam safety is so important.

Built in 1852 with design and construction compromises, the dam was also poorly maintained. This dam was much smaller than all of the dams we in the Kansas City District manage – it was approximately 72 feet high, 918 feet long, 10 feet wide at its crest and 220 feet wide at its base.

The American Society of Civil Engineers' investigated the failure in 1891. The committee's analysis led to the conclusion that alterations to the structure made during the construction and poor maintenance and improperly executed repairs led to the reduction of its spillway capacity and eventual overtopping and failure.

The U.S. Army Corps of Engineers focus on keeping our dams safe by routine monitoring and surveillance, field maintenance, repairs and rehabilitation, continuing inspections and evaluations, and also keeping people safe around and below dams by emergency action planning, active communication efforts, and public awareness measures.

During periods of high water on the Missouri River, the Kansas City District is typically storing water within our reservoirs to reduce inflows into the Missouri River. Water management is a balancing act to reduce the potential impacts of flooding on both our reservoirs and the Missouri River. How much water is coming into the reservoirs, how much is going out, reservoir pool elevations, forecasted rain events, possible distress at our dams and along the levees of the Missouri River, and water elevations on the Missouri River all feed into the equation of how much water will be stored within our reservoirs and how fast we should release it.

As pool elevations rise, each dam has specific surveillance levels for heightened inspections and increased monitoring frequencies. On-site monitoring and surveillance is primarily performed by project staff at the lake – rangers, maintenance workers, and operations leads. Then when pool elevations reach a heightened stage, we will have engineers and operations staff from the central office on-site to assist project staff and check conditions at potential problems areas. If an emergency spillway release is forecasted, we will have all hands on deck due to the uncontrolled releases from the reservoir and potential for downstream flooding.

Water Management's goal is to never get to that point, according to Chris Purzer, chief of the Water Management Section, Kansas City District. "That is why it is important to make those bigger flood control releases in a prudent and timely manner. Flood control releases lower the pool to prepare for future rainfall while lessening the load on the dam," said Purzer.

"As pool levels increase, we become more alert to dam performance and the interaction between the reservoir and availability to discharge water downstream. We have completed inspections and risk assessments on our dams and generally understand how our dams should perform and where our risks are. However, there is always some uncertainty on expected performance, especially when pool elevations exceed records. Dam performance may impact how much water needs to be released and at what rate it should be released," said Scott Mensing, Dam Safety program manager, Engineering Division, Kansas City District.

The District collaborates with many partners to understand and agree on what is best for all. One example is Ameren Missouri which owns and operates the Bagnell Dam, which is about 93 miles below Truman Dam in south central Missouri.

"We have a very good working relationship with the Water Management people in the Kansas City District. The flood storage capacity of Truman Lake, coupled by the well-coordinated operation and surveillance of Truman Dam, gives us a great deal of comfort as we balance power generation needs with interests both upstream and downstream of our dam," says Alan Sullivan, consulting engineer for Ameren.

MISSION STATEMENT: Manage portions of the operations and maintenance program for reservoirs within the Kansas City District to provide safe dams. This includes routine monitoring and surveillance, field maintenance, repairs and rehabilitation, continuing inspections and evaluations, emergency action planning, internal communication with colleagues, and external communication with stakeholders.

VISION STATEMENT: The Dam Safety Program will protect life, property, and the environment by ensuring that dams have been designed and constructed, and continue to be operated and maintained as safely and effectively as is reasonably practicable. Engineering products correctly identify high risk problems, ensure efficient asset management, provide accurate and convincing justifications for budgeting, provide transparent messages for public safety, and engineering evaluations and design documentation have high technical competency with respected peer reviews

Facts & Figures

- KCD operates 18 lake projects - 9 in Kansas, 7 in Missouri, 1 in Nebraska and 1 in Iowa
- Kanopolis Dam - completed in 1948 (1st) and the last dam, Blue Springs was completed in 1988
- Total normal storage of all 18 lakes is 4.8 million acre-feet with maximum storage of 15.8 million acre-feet
- Average dam height is 121 feet

St. Joseph levee improvement project enters new phase

By James F. Lowe

Construction is closing on the first construction contract award for the gatewell structure at Station 325+01 on the right bank – the west bank – with the second construction contract commencing for the Brown's Branch gatewell structure on the left bank. 2018 will be a very busy year for design and kicking off of multiple construction contracts supporting levee improvements in the St. Joseph, Mo., area.

"We are committed to the communities of St. Joseph, Elwood and Wathena to deliver the projects in a timely manner especially since the project was fully federally funded in 2017 with nearly $42 million received. The partnership with project sponsors and stakeholders has been key, with nearly half of the sponsor cost share already being provided to date," said Craig Weltig,

Civil Works project manager for the St. Joseph levee improvement for the Kansas City District.

R471-460 GATEWELL AT STATION 325+01. The first phase of the overall levee system construction project is scheduled to be completed in February of 2018 and is extremely important to our non-federal sponsors and stakeholders. Hill Brothers Construction, Inc. has been hard at work removing the old gatewell structure, constructing a larger, more efficient structure, while also providing temporary protection to the mainstem levee while the structure is under construction.

L-455 BROWN'S BRANCH GATEWELL. The second construction contract to get underway is for the Brown's Branch Gatewell Structure on the left bank. The contract was awarded to Meyer Contracting, Inc. for a little over $3 million. Mobilization to the site will occur in the beginning of 2018. The 18-month construction project will provide Brown's Branch with the necessary main-stem levee risk reduction that will tie into the next left bank levee raise project.

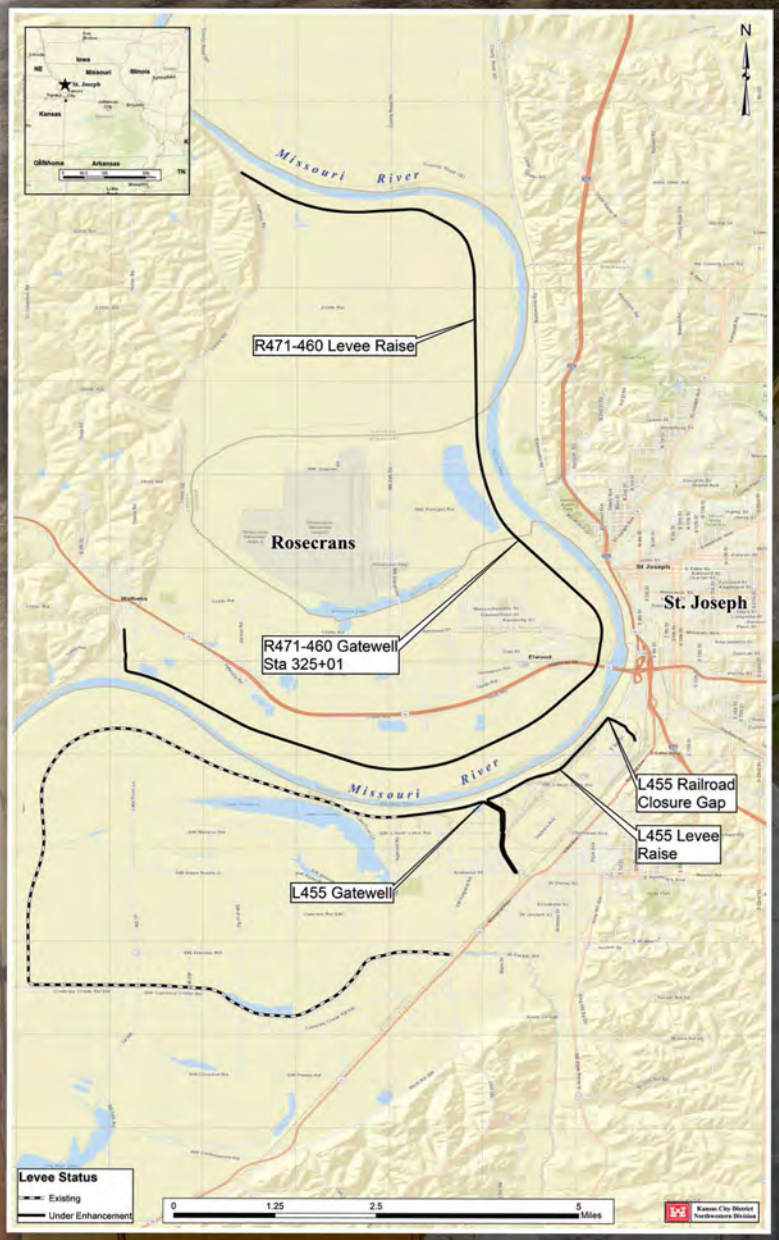
DESIGN OF L-455. The USACE in-house product development team is continuing design of the left bank levee raise. Challenges with obtaining approvals from the railroad led to the decision of having multiple construction contracts for the left bank. The team is currently working on finalizing the levee raise for L-455 and starting the gate closure structure design for the crossing of the dual Union Pacific Railroad tracks and the single Burlington Northern Santa Fe track. The team is dedicated to providing a full design that includes construction drawings, specifications and a design documentation report.

DESIGN OF R471-460 LEVEE RAISE. The USACE in-house product development team started design of the right bank levee unit in the fall of 2017. The underseepage berms are currently being laid out, the in-house drill crew has started drilling the pilot holes to help aide in the relief well design. Coordination is starting to occur with the Kansas Department of Wildlife, Parks and Tourism, Roscrans Memorial Airport and the Federal Aviation Administration for the potential use of agricultural lease properties on the southern portion of the project to use for borrow and construction for mitigation needs. The team will provide a full design that includes construction drawings, specifications and a design documentation report for the overall project.

The St. Joseph sponsors and stakeholders –Elwood-Gladden Drainage District, St. Joseph Airport Levee District, South St. Joseph Drainage District, City of St. Joseph, Buchanan County, State of Missouri, Rosecrans Memorial Airport, local businesses and land owners- collectively continue open discussions that include teleconferences, small group meetings, or large meetings including state and national political staffers. This project is extremely important to the local community and that is reflective in the attention it receives from their respective congressional delegation. This is readily apparent with the Buchanan County ¼ cent sales tax that was overwhelmingly passed by the public in August 2016 and the $4.2 million in non-federal cost share provided this year.

Steve Johnston, director of the Community Alliance of St. Joseph, said, "This project is truly an example of collaboration at its finest. Protecting over 6,000 quality jobs from multiple businesses protected by the levee in addition the 139th Airlift Wing of the Missouri National Guard provides stable and economic growth for our future. We are appreciative to all of our stakeholders on the national, state and local levels. The U.S. Army Corps of Engineers has provided the solid framework, expertise and leadership for this vital initiative."

Many thanks to the partners involved not only this past year, but also for all of the decades that many have dedicated in making the MRLS R471-460 & L-455 Flood Damage Reduction Project a success. The $70 million project is scheduled to span four years with the non-federal sponsors providing a 35 percent share, with assistance from state and local governments, fully leveraging the 65 percent federal share.


N
Missouri River
R471-460 Levee Raise
Rosecrans
St. Joseph
R471-460 Gatewell
Sta 325+01
Missouri River
L455 Railroad
Closure Gap
L455 Levee
Raise
L455 Gatewell
Levee Status
Existing
Under Enhancement
0
1.25
2.5
5
Miles

Collaborative relationships critical to levee safety

By James F. Lowe
Photos by Jennie Wilson

Important to communities because of the benefits they provide, levee systems are part of our nation's landscape. For example, more than ten million people live or work behind levees in the U.S. Army Corps of Engineers Levee Safety Program. Located behind these levees nationwide are more than one trillion dollars of public and private property.

Levees do not eliminate flooding but these 14,100 miles of levees reduce flood risk to people, businesses, critical infrastructure and the environment.

Additionally, levee conditions, storm/flood intensity and frequency, and populations around these levees change. So, the USACE Levee Safety Program works with local levee sponsors and stakeholders to make sure these levees provide their intended benefits. Working together to assess, manage and communicate flood risks to residents and businesses is our priority. More than anything, life safety is paramount.

In the Kansas City District, Geoffrey Henggeler serves as our levee safety program manager.

"Levee safety is a shared responsibility. No single entity has all of the tools or resources to deal with levee and flood risk management issues. It takes a team effort between the levee owner, the Corps of Engineers and other stakeholders, including emergency management officials, local community leaders, and other local, state and federal agencies," said Henggeler.

Steve Fulk, manager of Missouri River Levee System – Levee 408 referenced Kansas City District assistance in keeping their 50-year-old levee viable, "Our levee was constructed in 1969 and protects about 10,000 acres of Missouri River bottom farm ground as well as the lower part of the town of Farley and the largest part of the community of Beverly in Platte County, Missouri." With 50 houses in the area, the area has not flooded even in 1993, said Fulk.

This "can only happen with qualified assistance that the USACE brings to the table. As a levee sponsor, we totally depend on their knowledge and expertise to guide us through the maintenance and upkeep that is necessary for a levee to perform when it is put to the test. I think we can all agree that the flood event of 2011 enhanced the effort to look harder than in the past at areas that needed attention and our District appreciates the scrutiny that has been involved through Periodic Inspections and pipe inspections as an example," said Fulk. He acknowledged the levee district's responsibility to actively monitor the condition of the levee and that the whole process is a team effort.

Fulk commended the Corps for being with them in the crisis of 2011. "We experienced sand boils for the first time at a level that could have been detrimental to the levees stability. They were on sight with us constantly that year to monitor our efforts to control these locations. One of the areas that developed sand boils that year was actually spotted from a Corps helicopter on a river run, which was then communicated to us, allowing us to respond accordingly."

Of the Kansas City District, Fulk said, "They have proven to be people with integrity and we will always strive to reciprocate."

"The Corps has been and continues to be helpful to the local Kansas City metropolitan levee sponsors," said Stephen Dailey, general manager, Fairfax Drainage District, located in the Kansas City metro area. "First of all, they conduct annual (and periodic) levee inspections that helps us prioritize and address areas along the levee that may need attention," said Dailey, who added that the levee districts bring value to the Corps by sharing information to help verify maintenance objectives and collaborate on many issues of concern.

Not everyone knows that USACE and FEMA have different roles and responsibilities related to levees. FEMA addresses mapping and floodplain management issues related to levees, and accredits levees as meeting requirements set forth by the National Flood Insurance Program. USACE addresses a range of operational and maintenance issues, risk communication, risk management, and risk reduction issues as part of its responsibilities under the Levee Safety Program.

Depending on the levee system, FEMA and USACE may be involved with the levee sponsor and community independently or -- when a levee system overlaps both agency programs -- jointly. Under both scenarios the long term goals are similar: to reduce risk and lessen the devastating consequences of flooding.

In support of the Emergency Management mission, crews deploy across the globe.

SILVER JACKETS
working to communicate risks

By Trisha Dorsey

"We're connecting the dots. I love being part of a team which brings people together and contributes little parts to make a whole project," said Brian Rast, Kansas City District Lead Silver Jackets Coordinator for Kansas and Missouri.

Through the U.S. Army Corps of Engineers Institute for Water Resources, program funding is provided to Corps of Engineers districts enabling them to partner with agencies in reducing risks from natural hazards. This program is called Silver Jackets.

"Our mission is to participate with state and federal agencies in actions leading to measurable hazards mitigation with the strongest focus on flood hazards," said Rast. "Public involvement and levee safety have been on the horizon for special projects in the past several years. We've been able to capitalize on this emphasis to provide public awareness and to help agencies think about the next actions - not just relying on levees."

In 2014, a Silver Jackets levee safety pilot project was initiated along the Missouri River in Buchanan County, Missouri. Through this pilot project the Silver Jackets team worked on developing a template for emergency action plans which outlined who does what and when during a high-water emergency. Meaning, if water is forecasted to reach a certain level, the template action plan provides an outline for the levee sponsors to plan for a response action and create a process for multiple scenarios. The hope is for other levee sponsors to see this action and be able to create their own plans in the future.

Rast explained several Silver Jacket projects are launched each year, depending on funding through the Institute for Water Resources, to work with state and federal agencies on water-related solutions. One of those past projects was Missouri River flood-forecast inundation maps from Leavenworth, Kansas to Parkville, Missouri. The main focus of the project was understanding information faster in order to communicate quicker.

> "We recognized our technical expertise through geographic information systems, emergency management, hydraulic teams and more, and realized we could create a two-dimensional model for that stretch of the river," said Rast. "Missouri River Flood Event Simulation Mapping was the product outcome of this effort. In coordination with forecasts from the Weather Service, we have a team of experts that can create a complex model in eight hours that can map potential impacts allowing for quicker communication to communities."

As the Silver Jackets program continues to gain traction, funding for project implementation is increasing. For 2018, the Silver Jackets program has more than $1.1 million combined for Missouri and Kansas.

Just one effort on the horizon this year is to work with the Missouri Levee and Drainage District Association to help communicate flood-risk management. This effort will be focused on capturing important messages and communicating certain themes to local communities.

"We kicked this effort off in October 2017 and expect it will take about a year. We will focus on who the Corps of Engineers is, where our boundaries are and who to contact for assistance. We will also note who the state agencies are, the levee systems in the area, how they work, and provide inundation mapping and online resources," explained Rast.

Another focus will be engaging and communicating with the new generation of levee sponsors.

"We want to train the next generation of risk managers. We want to connect the dots, the resources and technical services to communities and levee sponsors in Kansas and Missouri," said Rast. "Risk management involves risk communication and risk assessment as well as a sustained effort by these communities and levee sponsors."

The Corps of Engineers is dedicated to the Silver Jackets program and its several projects.

"We have a cadre of technical experts and look forward to sharing information with agencies and communities," said Rast. "Find us online to learn more about Silver Jackets and our process for connecting the dots with agencies and communities."

For more information or to get involved with Silver Jackets, visit the program online at https://silverjackets.nfrmp.us/state-team/missouri.

River outreach underway

By Trisha Dorsey

Communication is key, and the Kansas City District understands that concept and strives to implement it.

"We have more stakeholders than we know," said John Grothaus, Kansas City District's chief of planning. "We are actively searching for them, working to communicate with them to learn their needs while informing what the Corps of Engineers does and how we can best serve the public."

In 2016, the Planning Branch assigned a dedicated individual to reach out to communities along the Missouri River from Rulo, Nebraska to St. Louis, Missouri to meet stakeholders and understand their concerns and help explain the Corps of Engineers' missions. Kenneth Wade, outreach specialist, is the individual who performs these duties. As a 32-year native to the Kansas City District, serving in several roles, he has an understanding of the full spectrum of regulations and authorities the Corps has.

"What we are trying to do is focus on communication with stakeholders along the river," informed Wade. "We are trying to find the folks who haven't been contacted by the Corps of Engineers and working to educate them on what our mission is in relation to the Missouri River and the authorities the Corps has. I meet with them, listen to their comments and concerns and deliver them back to leadership at the Kansas City District."

This effort is very important to the Corps of Engineers in order to have a better understanding of the partnerships that exist between local partners, state and other stakeholders and how critical those partnerships become when we all pull together in time of need.

Wade (right) met with Ainit Malinkrodt, historian in Augusta, Missouri in 2017. During his meeting with Malinkrodt, Wade discussed river safety, boating safety and flood safety. (photo provided)

> "Relationships are important to working together to improve conditions, operations and procedures. Better communication is essential to having beneficial, productive relationships and improving relationships," said Grothaus. "That's why river outreach is so important to us."

In 2017, Wade made 110 contacts along the Missouri River. He says he isn't knocking on doors, but rather works with communities to engage with boards of directors, mayors and more. In face to face discussions, he talks river regulations, erosion concerns, the process on repairing structures, intakes and gages. He works to explain the Corps of Engineers roles and missions to rural areas along the Missouri River corridor.

"In small communities along the Missouri River, say 100 people in the town, we work to identify the county seat," informed Wade. "I find the point person for that community, reach out to them via phone, inform them who we are and what we do, and try to learn if they have an erosion or safety concerns along the river. If so, that's when I go out and meet them on site, listen to their comments and questions and bring their concerns back to district leadership."

For 2018, Wade is excited to get back on the river and meet new stakeholders. In addition to one on one conversations, Wade is available to meet with groups and provide presentations.

Flood Preparation and Flood Preparedness

By Jud Kneuvean and David S. Kolarik

Flood preparedness is always a top priority for the Kansas City District, because the frequency and scale of flooding are very hard to predict we try to follow a consistent process from year to year. We will begin updating our internal flood fight teams early this year. Personnel turnover somewhat drives the type and scale of training that we provide internally. Another key consideration for training and exercises is the frequency of flood response by the District. The District noted no appreciable flooding for the period from 1998 to 2007. As a result, we were more reliant on training and exercises to ensure preparedness of District personnel.

Since 2007, we have much more real world flood response experience, which allows us to scale back some of our training or tailor it to better serve our needs like developing activity specific training for our mobile liaison and technical response teams. Turnover of personnel can be another driving factor in the type of training and exercises we conduct. We must annually familiarize our existing teams with standard policies and procedures on how we conduct flood fights.

Since 2011, we've looked at flood fights from a regional perspective. We work with the Northwestern Division Readiness and Contingency Operations Office, the Northwestern Division water management, and the Omaha District to consider what the Missouri River basin flood outlook is for the upcoming spring flood season. We try to look at basin conditions which includes National Weather Service forecasts, the condition of existing levee systems, and the status of ongoing projects, either new or rehabilitation, to provide all with a regional overview of current or forecasted conditions.

As we move out of winter, we'll begin looking for the NWS long-range forecasts, which will give us their thoughts as to what the precipitation outlook will be, normal, higher than normal, below normal. We use that along with reservoir conditions to determine what kind of communication or additional training/exercises we need to conduct with our state and local partners. Once the District has developed its own spring flood assessment, we begin the process of sitting down with our federal, state and local partners to inform about and discuss preparedness issues for the upcoming flood season.

Public sponsors may request flood fight training at any time. The request must be in writing and the public sponsor must agree to provide a facility that can accommodate 30-40 personnel for classroom training and an outside location that can be used to demonstrate sandbag filling and placement techniques. Additionally, the public sponsor is responsible for providing supporting materials for the outdoor portion of the training to include sand and a small loader like a Bobcat capable of loading a sandbag filling machine.

The District provides trainers, training materials, and sandbags at no cost to the public sponsor. We conduct at least two sessions of flood fight training for public sponsors annually. Our focus is usually on sponsors of congressionally authorized levee projects; however, over the last couple of years we have been working to expand our flood fight training audience. We are currently working with the Missouri National Guard to develop flood fight training that will meet their needs. We are also planning to provide training to a broader audience at the 30th annual Missouri State Emergency Management Conference in August 2018.

How can our levee sponsors help us? Information we need to know from our levee sponsors includes local conditions, reports of localized heavy rainfall, what tributary inflows look like, whether they are normal or high. We need to know whether local sponsors have initiated some sort of Operation and Maintenance action, like replacing a culvert, modifying a cross section, or anything that would require some sort of flood fight action to ensure levee performance during a flood. We want feedback from our stakeholders on how we can better serve them.

Tom Waters, Chairman of the Missouri Levee District Drainage Association, believes much can be done prior to experiencing a flood event. He stated levee sponsors should be encouraged to predetermine potential needs and acquire easements for ingress, egress and borrow areas from property owners in advance of flood events. Having easements in place prior to flood events will help speed the rehabilitation process if the levee is damaged.

Waters added the Corps might put more boots on the ground to get more eyes on the problem. The Corps could work more closely with sponsors to develop a plan to move forward with recovery during a flood. He said the Kansas City District does a good job sharing information via social media, which he said is more and more important especially during flood situations.

"For years we've worked with the Corps and there is a positive synergy between us as we mutually benefit from the good working relationship," said Waters.

2018
Missouri River Stakeholder Engagement Calendar

The Kansas City District seeks to maintain and strengthen relationships with stakeholders throughout the Missouri River Basin. The district strives to meet with citizen organizations, levee districts, drainage district and state and federal agencies through various engagement meetings throughout the year. A few engagements regarding the Missouri River and its stakeholders are outlined below.

1st Quarter (January - March)

- Annual Navigation meeting
- Missouri Levee & Drainage District Association annual meeting
- Missouri River Recovery Implementation Committee plenary meeting
- Missouri River Association of States and Tribes (MoRAST) quarterly meeting
- Missouri River Interagency Roundtable (MRBIR) bi-annual meeting

2nd Quarter (April - June)

- Missouri River Recovery Implementation Committee plenary meeting
- Missouri River Association of States and Tribes (MoRAST) quarterly meeting

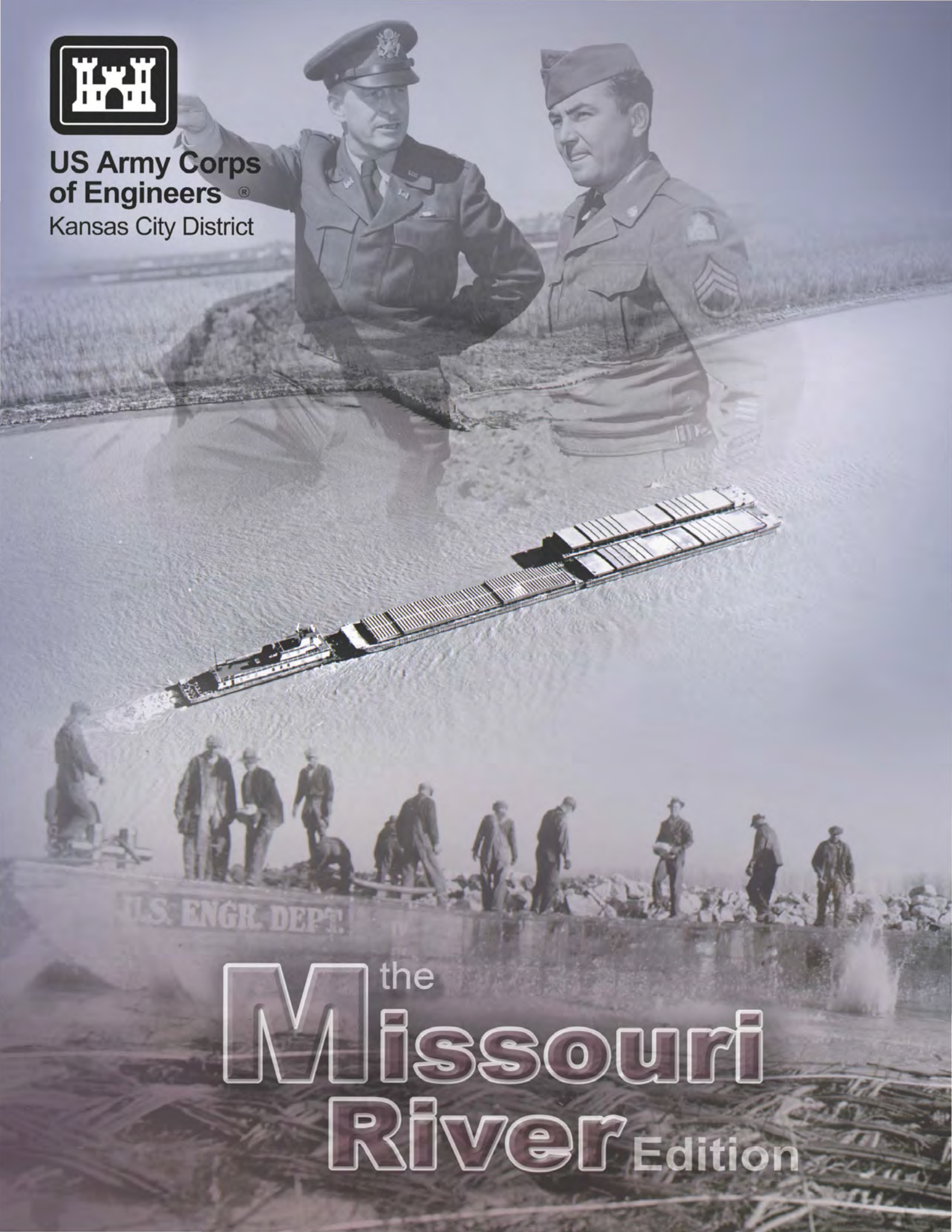
3rd Quarter (July - September)

- Missouri River Association of States and Tribes (MoRAST) quarterly meeting
- Missouri River Interagency Roundtable (MRBIR) bi-annual meeting
- Annual Missouri River stakeholder barge tour

4th Quarter (October - December)

- Missouri River Recovery Implementation Committee plenary meeting
- Missouri and Associated Rivers Coalition annual meeting
- Missouri River Association of States and Tribes (MoRAST) quarterly meeting

** This list is not all inclusive and all dates/ meetings are tentative and subject to change.*


US Army Corps
of Engineers ®
Kansas City District
U.S. ENGR. DEPT.
the
Missouri
River Edition