MISSISSIPPI RIVER AND TRIBUTARIES

WATERWAYS ACTION PLAN

MISSOURI RIVER ANNEX
2026

Downtown Kansas City; ASB Railroad and Highway Bridge looking downstream to Kit Bond Bridge.

MISSOURI RIVER ANNEX

Table of Contents

Introduction

This appendix provides a consolidation of general information and target gauges to be used as a guideline for a crisis on the Missouri River. Like a crisis on the Upper Mississippi River (UMR), it is the responsibility of the United States Coast Guard (USCG), United States Army Corps of Engineers (USACE), and River Industry representatives to meet and discuss conditions on the Missouri River (MOR) and to annually review the actions specified in the plan. This annex will normally be reviewed in conjunction with the MOR Navigation meeting. In Section 4 of this annex, the MOR has Action Plan Tables for High Water, Low Water and High Current. An Action Plan Table for ice conditions is not included as navigation does not normally occur during the ice period mid-December to mid-March of each year. The tables are divided by river reaches with three action phases (e.g., *Watch, Action, and Recovery Phases*) described in the plan. Support tables of historical river flow discharges and river stage references, including recommended close and open watch stages, are included.

This plan is intended to report damage to the transportation infrastructure as a result of an incident, coordinate alternate transportation services, coordinate the restoration and recovery of the transportation infrastructure, and coordinating and supporting prevention, preparedness, and mitigation among transportation stakeholders at the state and local levels.

Acronym List for Missouri River Annex

AIS = AUTOMATIC IDENTIFICATION SYSTEM
AWO = AMERICAN WATERWAYS OPERATORS
BNM = BROADCAST NOTICE TO MARINERS
CFS = CUBIC FEET PER SECOND
CRP = CONSTRUCTION REFERENCE PLANE
DWB = DISTRICT WESTERN BRIDGES
ICP = INCIDENT COMMAND POST
JIC = JOINT INFORMATION CENTER
MM = MILE MARKER
MOR = MISSOURI RIVER
MRAC = MISSOURI RIVER ACTION COMMITTEE
NOAA = NATIONAL OCEANIC ATMOSPHERIC ADMINISTRATION
NWO = USACE OMAHA DISTRICT
NWD = USACE NORTHWESTERN DIVISION
NWK = USACE KANSAS CITY DISTRICT
NWS = NATIONAL WEATHER SERVICE
O&M = OPERATION AND MAINTENANCE
PMV = PERMANENTLY MOORED VESSEL
RIAC = RIVER INDUSTRY ACTION COMMITTEE
RIBB = RIVER INFORMATION BULLETIN BOARD
UMIB = URGENT MARINE INFORMATION BROADCAST
USACE = ARMY CORPS OF ENGINEERS
UMR = UPPER MISSISSIPPI RIVER
USCG = UNITED STATES COAST GUARD
USGS = UNITED STATES GEOLOGICAL SURVEY
WAP = WATERWAYS ACTION PLAN

Section 1 – Geographic Description

The Missouri River Basin drains 529,000 square miles, including about 9,700 square miles located in Canada. The basin spans 10 states, including all of Nebraska, most of Montana, Wyoming, North Dakota, and South Dakota; about half of Kansas and Missouri; and smaller parts of Iowa, Colorado, and Minnesota. The Missouri is fed from several major tributaries, the Yellowstone, Platte, Kansas, Grand, and Osage Rivers.

The MOR extends 2,619 miles from its utmost source at Browers Spring on Hell Roaring Creek and 2,321 miles from Three Forks, Montana where the Jefferson, Madison, and Gallatin Rivers converge. The MOR is the longest river in the United States, draining one sixth of the country. The Missouri River Main Stem System consists of six dams and reservoirs on the MOR located in Montana, North Dakota, South Dakota, and Nebraska. The six are Ft. Peck Dam in Montana, Garrison Dam in North Dakota, Oahe Dam, Big Bend Dam and Ft. Randall Dam in South Dakota and Gavins Point Dam in South Dakota and Nebraska. The System has a capacity to store 73.1 million acre-ft of water, which makes it the largest reservoir system in North America. The USACE regulates the System to serve the congressionally authorized project purposes of flood control, navigation, irrigation, hydropower, water supply, water quality, recreation, and fish and wildlife. The USACE considers all the congressionally authorized project purposes when making decisions to optimize the development and utilization of the water resources of the Missouri River Basin to best serve the needs of the people. The System is regulated as an integrated hydraulic and electrical system. Runoff from above the System is stored in the six reservoirs. Water is released from the System as needed for downstream flow support. Released water from the lowest dam in the System, Gavins Point Dam, flows down the Missouri River, which includes the Bank Stabilization and Navigation Project from Sioux City, Iowa to the mouth near St. Louis, Missouri.

The Missouri River Bank Stabilization and Navigation Project was first authorized in 1912 with six subsequent authorizations that changed channel dimensions and extended channel reaches. The most recent authorization was by the March 2, 1945, Rivers and Harbors Act. This act authorized a 9 foot deep by minimum 300-foot-wide navigation channel from Sioux City, Iowa to the mouth. The 734.8-mile navigation channel is continuous, flowing freely without locks or dams. A sinuous course of reverse bends and controlled river width was managed by constructing rock or piling structures called dikes and revetments. Dikes were constructed perpendicular to the flow and revetments were constructed parallel to the flow. This arrangement manages the constant movement of sediment to minimize channel shoaling providing a consistent and reliable navigation channel without the need for maintenance dredging.

Section 2 – Parties and Roles

U.S. Coast Guard (USCG)
USCG Sector Upper Mississippi River (SUMR), with its principal office in St. Louis, MO is responsible for safety of navigation, security, and law enforcement along the MOR. SUMR Prevention Department, Waterways Division, using the cutters Gasconade and Cheyenne, stationed in St. Louis, are responsible for maintaining and setting buoys and shore aids along the MOR. The Prevention Department also focuses on licensed mariner's issues, permits, casualty investigations, and security verifications. SUMR Response Department uses USCG small boats, other law enforcement partnerships and first responders to patrol and respond to emergencies or incidents on the MOR.

U.S. Army Corps of Engineers (USACE)
The day-to-day operation and maintenance (O&M) for the Missouri River Bank Stabilization and Navigation Project (BSNP), Sioux City, IA to the Mouth is managed by two river field offices. The Missouri River Project Office, located in north Omaha, at river mile 627.0, is responsible for the O&M from Sioux City, Iowa to Rulo, Nebraska. The Missouri River Area Office, located at Napoleon, Missouri, at river mile 328.7, is responsible for the O&M from Rulo to the mouth and has a satellite floating plant facility at Gasconade Harbor at river mile 104.5 and a satellite office located in Glasgow, MO, river mile 226.4 that houses additional survey crew. These offices report to Omaha District (NWO) and Kansas City District (NWK) respectively. NWO and NWK report to the Northwestern Division (NWD), Portland, Oregon. There is a Division Regional Office in Omaha, Nebraska that provides the day-to-day support for both Districts concerning the MOR. NWK and NWO have Water Management functions for the regulation of tributary dams in the Missouri River basin dividing their responsibilities at Rulo, Nebraska. The NWD Missouri River Basin Regional Office located in Omaha has the Water Management responsibilities for the Missouri River Main stem System and coordinating responsibilities on tributary reservoir regulation.

U.S. Coast Guard District Heartland Bridge Branch (DWB)
The Bridge Administration Program has a mandated responsibility to protect the public right of navigation. Activities include determining location of navigation channel piers and issuing bridge permits. They establish, revise and monitor drawbridge regulations and prescribe bridge lighting. Also, Truman-Hobbs studies of unreasonable obstructive bridges are conducted on a nationwide basis.

RIAC & MRAC
The River Industry Action Committee (RIAC) is an association of companies and organizations, who are stakeholders in the commercial industry on the inland rivers, with a focus on issues that impact the Upper Mississippi River (UMR) from Cairo to St. Paul. As the name suggests, they act in an advisory capacity on a wide range of issues affecting the activities of the industry on the rivers. They provide an industry perspective to the USCG and the USACE on matters such as high and low water, ice conditions, shoaling, marine accidents, etc. In 2008, the Missouri River navigation stakeholders formed the Missouri River Action Committee (MRAC) to function in a similar way as RIAC with a focus on MOR issues. MRAC provides industry representation, who along with the USACE and USCG, partner and coordinate during emergent issues impacting navigation on the river.

Designated Waterfront Facilities
The commercial interests of the designated waterfront facilities are directly impacted by navigation conditions on the MOR, and any actions taken by the USCG or USACE in response to hazardous conditions that develop on the river. These facilities can play a valuable role in providing feedback to other parties on both river conditions and impact of proposed actions of the USCG and USACE.

State Emergency Managers

Hazardous conditions on the MOR, particularly high water/flooding conditions, frequently involve state emergency managers, as they become involved in responding to affected communities, and take a direct interest in conditions or activities that can affect the levee systems that protect those communities. State emergency management offices coordinate state, private and federal support to local and tribal governments. It's important to provide timely risk assessment information and incident briefings to the state emergency management offices. Risk assessments and incident briefings will then be shared by the appropriate state emergency management office with local/tribal emergency managers and other appropriate agencies through Situation Reports and other forms of notification. Requests for assistance by a local/tribal government must be coordinated through state emergency management. Emergency contact information follows.

USACE and USCG Equivalencies

USACE POSITION Kansas City District MM 498.4 – 0.0	**DUTIES & RESPONSIBILITIES**	**EQUALS**	**USCG POSITION**	**DUTIES & RESPONSIBILITIES**
Operations Project Manager, Missouri River Area Office, Napoleon, MO	Supervises Missouri River Area Office		Chief, Waterways Management Division, SUMR	Manages daily waterway management and casualty operations
Deputy Operations Project Manager, Missouri River Area Office, Napoleon, MO	Day to day O&M Missouri River, Rulo, NE to the mouth			
Chief of Operations, Kansas City District	Supervises Operations Manager		Chief, Prevention Department, SUMR	Supervises operational issues
Chief, Water Control for Tributaries	Supports Chief of Operations		Chief, Waterways Management Division, SUMR	Manages daily waterway management and casualty operations
Chief, Reservoir Control Center Northwestern Div	Coordinates with Chief of Water Control & Supports Division Commander		Chief, Prevention Department, SUMR	Coordinates with Chief of Waterways & Supports Sector Commander
District Commander Kansas City District	Supervises Chief of Operations		Commander, SUMR	Senior USCG officer in area
Division Commander Northwestern Division	Supervises District Commander		Commander, Heartland Coast Guard District	Senior USCG officer in District

USACE POSITION Omaha District MM 734.8 – 498.4	DUTIES & RESPONSIBILITIES	EQUALS	USCG POSITION	DUTIES & RESPONSIBILITIES
Technical Support Chief Missouri River Project Office, Omaha, NE	Day to day O&M Missouri River, Sioux City, IA to Rulo, NE		Chief, Waterways Management Division, SUMR	Manages daily waterway management and casualty operations
Operations Manager, Missouri River Project Office, Omaha, NE	Day to day O&M Missouri River, Sioux City, IA to Rulo, NE			
Chief of Operations, Omaha District	Supervises Operations Manager		Chief, Prevention Department, SUMR	Supervises operational issues
Chief, Water Control for Tributaries	Supports Chief of Operations		Chief, Waterways Management Division, SUMR	Manages daily waterway management and casualty operations
Chief, Reservoir Control Center Northwestern Div	Coordinates with Chief of Water Control & Supports Division Commander		Chief, Prevention Department, SUMR	Coordinates with Chief of Waterways & Supports Sector Commander
District Commander Omaha District	Supervises Chief of Operations		Commander, SUMR	Senior USCG officer in area
Division Commander Northwestern Division	Supervises District Commander		Commander, Heartland Coast Guard District	Senior USCG officer in District

Section 3 - Communications

Initiation of Communications Plan- This section provides guidance on the methods of communicating and receiving information. The Coast Guard, USACE and maritime industry carefully monitor river conditions and levels. When any of the conditions warrant attention, (high water, low water, high flow, ice or any other hazardous condition), any MOR stakeholder can request a conference call by contacting either the USCG Sector UMR Chief of Waterways, the USACE, or the Chair of RIAC and/or MRAC. If further discussion is needed the members listed on the following pages of this section to include Industry, and State personnel will be contacted via email or phone call. The RIAC and/or MRAC chairs will contact those members of their respective organizations. From there, if appropriate, a teleconference will be set up to confer with all parties on possible measures to take and joint courses of action using the guidance from this annex as a basis to make a determination. By conferring frequently with all MOR stakeholders, a joint action plan to safely navigate during the condition that warranted initiating the communications plan will be developed. The action plan will then be communicated to all MOR stakeholders using Broadcast Notice to Mariners, Sector UMR Homeport at https://homeport.uscg.mil and Local Notice to Mariners.

In the event of an unexpected river closure, the following steps will be considered to reopen the river: Conduct test tows if necessary for potential problem areas. Develop and initiate recovery plan to clear the queue. Issue advisory or establish safety zone if deemed necessary that indicates extreme low water, high water, or high current. USCG will reset buoys in those narrow channel locations within reach. USACE will continue increased level of channel reconnaissance. Consider draft limits, tow sizes, and helper boats. Evaluate fleet dimensions. Be aware of shifting channels, emergency dredging may be required at some locations. Consider restrictions on single skin barge movement. Continue communications (e-mails, conference calls or others) – consider establishing notices, advisories and/or safety zones as needed using standard communication links between USACE, USCG and Industry.

Phone Conference Call Agenda:

I. Roll Call by Phone Conference Host
II. Protocol for Conference Call
III. Open Statement by Chairman or Co-Chairman of MRAC on Issues
IV. Weather Forecast by NWS or USACE
V. River Stage Forecast by USACE
VI. Channel Report for Area Of Concern by USACE
VII. Status of Dredging and Next Scheduled Locations
VIII. USCG Report on Advisories and Remarks
IX. USCG Buoy Tender Report on Channel Conditions
X. River Condition Report and Issues of Conference Call by Industry
XI. Discussion of Issues on Current Situations
XII. Assessment, Actions to Be Taken
XIII. Closing

All Agencies & Organizations
To ensure effective interagency cooperation during periods of coordinated response to rising water, falling water, very high current or other hazardous river conditions, stakeholder organizations are advised to **maintain active and ongoing communications with one another during normal river conditions and while planning together for joint response activities**. This will greatly facilitate speedy and effective communications under the pressure of responding to an event. These communications will be facilitated by the contact listing on the following pages of this section. As an aid to those looking to better understand USCG and USACE internal notification procedures, a description of these procedures is provided in paragraph "Notifications" that follows.

Vessel to Vessel and Vessel to Shore Communications
VHF communications on the MOR are handled by the communications center at USCG Sector UMR in St. Louis, MO. Primary contact is made on channel 16 then; generally, you will be instructed to switch to another channel to continue discussion.

Notifications

U. S. Coast Guard:

The USCG maintains a 24/7 live watch at Western Rivers Command Center in St. Louis, MO. Hazardous river conditions are monitored by Sector personnel and reported as appropriate to the Sector Commander. As conditions dictate, the Sector will release Broadcast Notices to Mariners (BNM) or Urgent Marine Information Broadcasts (UMIB) with safety advisories, safety zones, or river closures. This information will also be posted on the Sector UMR Homeport. As noted above, these waterways control measures are determined in consultation with the USACE and representative of the river industry.

USACE:

During Normal Work Hours
During periods of hazardous river conditions, the USACE field offices work closely with river users and the basin river communities. The field office staff reports the river conditions and impacts to their respective District Office and NWD Point of Contact. The USACE has two district offices responsible for the MOR: the Omaha District and the Kansas City District. The District boundaries split at Rulo, Nebraska (MM 498.4). The field staff report to district staff persons within Operations Division and Emergency Management Division. Operations Division staff will inform the District Water Control or Water Management Offices, the district leadership and the District Commander. They will also notify Division Water Management. They will then contact appropriate staff person in the Division Office, who will notify, the appropriate Division leadership and the Division Commander. The District Operations staff will coordinate with the USCG throughout the hazardous period. When river conditions become too hazardous for safe navigation or if continuing navigation causes an unsafe condition such as causing levee erosion or interfering with flood fighting, etc., the USACE through the appropriate District Commander will make recommendations to the USCG to issue safety zone restrictions or river closures. Likewise, as river conditions improve the USACE, through the appropriate District Commander, will make recommendations to the USCG to remove the safety zone restrictions or reopen the river to navigation.

After Normal Work Hours, Weekends and Holidays
Any USACE staff person, field office, District or Division who becomes knowledgeable of a hazardous river condition will contact the Kansas City District or Omaha District Emergency Management Office 24/7- hour phone number. The Emergency Management Offices maintain the most up-to-date contact list with home and cell phone numbers of USACE staff responsible for
emergency response to hazardous river conditions.

Iowa Homeland Security & Emergency Management Department (HLSEM)

HLSEM is responsible for coordinating emergency preparedness activities across the State of Iowa. Iowa Homeland Security supports asset protection initiatives and promotes security awareness among all citizens. When an emergency of state or regional significance occurs, HLSEM coordinates response and recovery assistance. HLSEM engage all state response capabilities and facilitate emergency aid across local and state political boundaries. When it is needed, HLSEM is responsible for requesting and coordinating assistance from partner states and the federal government.

HLSEM believes that productive information sharing relationships are critical to homeland security and emergency preparedness. When information concerning the safety and security of Iowa's citizens and communities becomes available, please contact the HLSEM Duty Officer. The Duty Officer can put you in contact with Operations Officer (MARSEC POC), or Chief of Operations.

Missouri State Emergency Management Agency

The Missouri State Emergency Management Agency (SEMA) coordinates and develops the State Emergency Operations Plan, oversees Missouri's disaster preparedness, floodplain management, hazard mitigation and public assistance programs as well as coordinates the state's response operations for all types of large-scale emergencies anywhere in the state.

SEMA and the State Emergency Operations Center (SEOC) are located at the Missouri Army National Guard Ike Skelton Training Site, east of Jefferson City. SEMA has a state-of-the-art facility and technical equipment to direct Missouri's disaster emergency response and recovery operations. The SEOC enables all state agencies to come together during an emergency, gather information from local jurisdictions and quickly respond to the disaster. The EOC has fully functional workstations, access to communication resources that include radio, telephone, satellite, and wireless computer links.

The State EOC is designed to support 24/7 operations with kitchen facilities, showers, security, and lodging capability. The Missouri Information Analysis Center is located directly adjacent to SEMA offices and is an integral part of Missouri's response team.

SEMA has direct coordination and support for local emergency managers through nine area coordinators, one assigned to each region of the state. These SEMA employees have vehicles equipped with the latest in radio, satellite and mobile data terminal technology, most recently used during a dam failure in rural Missouri.

SEMA's Director is James Remillard and Deputy Director is Terry Cassil.

Nebraska State Emergency Management Agency

The State Emergency Management Agency mission is to provide for the coordination and implementation of measures and procedures designed to meet the danger to the citizens and communities of Nebraska caused by natural, man-made or technological disasters, civil disturbances, or hostile military or paramilitary action. To prepare for a prompt and efficient response protects lives and prevents the loss of property from all hazards. To ensure that the public is served in a timely and efficient manner, to provide for effective utilization of resources to support local political subdivisions in disaster recovery activities and to establish and implement a management system for coordinating State agencies', Federal agencies', private and non-governmental agencies' respond using the muti-agency coordination structure in

the National Response Plan (NRP) and in accordance with the National Incident Management System (NIMS).

North Dakota Department of Emergency Services

The N.D. Department of Emergency Services (NDDES), comprised of the Divisions of Homeland Security and State Radio, provides 24/7 emergency communications and resource coordination with more than 50 lead and support agencies, private enterprise and voluntary organizations to assist local jurisdictions in disaster and emergency response activities. Each community maintains a direct responsibility for the safety of its citizens. Local and tribal governments provide initial response to incidents, emergencies, disasters or catastrophes. Local Emergency Managers serve a key role in coordinating response and recovery efforts and offer a better understanding of the situation and accompanying resource requirements. NDDES supports response and recovery coordination with Emergency Managers in each county and tribal nation within the state of North Dakota as well as the cities of Bismarck and Fargo.

The State Emergency Operations Center (SEOC) utilizes the Incident Command System (ICS) and serves as a central location for coordinating technical and resource assistance from state, federal, private, and voluntary agencies in support of local government. WebEOC, which aids coordination and interoperability of response and recovery activities among affected jurisdictions, is used in the SEOC to report and track information to provide situational awareness to responding agencies and jurisdictions. In addition, the SEOC uses EmerGeo, a GIS mapping software tool that interfaces with WebEOC, to develop a common operating picture. The section maintains a 24/7 duty officer who monitors day-to-day incidents, activities and events throughout the state. The Duty Officer also serves as the primary contact for incident reporting and requests for state and federal assistance.

Kansas Emergency Management

The mission of the Division of Emergency Management is to provide a 24-hour operation to reduce loss of life and property, protect Kansans from all hazards by providing and coordinating resources, expertise, leadership and advocacy through a comprehensive, risk-based emergency management program of mitigation, preparedness, response and recovery.

The current Emergency Management Program in Kansas stems from two major legislative initiatives: the Federal Robert T. Stafford Disaster Relief Act, as amended, and Chapter 48, Article 9 of the Kansas Statutes Annotated. The Division of Emergency Management is the arm of the Adjutant General's Department that provides mitigation advocacy, planning requirements and guidance, response coordination, and administration of recovery programs for the civil sector of the State, regardless of the type of hazards.

The Kansas Statutes Annotated requires that each county maintain a disaster agency responsible for emergency preparedness and coordination of response to disasters. The Statutes also require each county to maintain an Emergency Operations Plan that has been approved by the Division of Emergency Management. These statutes are the basis for the State/local relationship, which is solidified by continued contacts and mutual assistance on day-to-day operations, and during times of disasters. The State and local governments work together to provide training to local emergency management and response personnel. The same is true for the conduct of periodic exercises to test the State and local emergency management systems.

South Dakota Emergency Management

The Office of Emergency Management is charged with the overall mission of protecting South Dakota's citizens and their property from the effects of natural, manmade, and technological disasters. To fulfill this mission, the Office recognizes and utilizes the four phases of emergency management:

Preparedness: Actions taken in advance of an emergency/disaster to develop operational capabilities and facilitate response operations. Such measures may include the development of plans, procedures, warning and communications systems, and mutual aid agreements and emergency public information.

Response: Actions taken during or after an emergency/disaster to save lives, minimize damages and enhance recovery operations. These measures include activation of emergency operation centers, plans, emergency communications system, public warning, mass care, shelter, search and rescue, and security measures.

Recovery: Actions taken over the short or long term to return vital life support systems to minimum standards or to return life to normal or improved levels. Such measures include damage assessment, supplemental assistance, economic impact studies, and mitigation of damage sustained.

Mitigation: Actions that can be taken to eliminate or reduce the degree of long-term risk. Such measures include building codes, public education, hazard vulnerability analysis and zoning laws and resolutions.

MOR Contact List	
MRAC	
Chair – Steve Engemann	(573) 220-4908 steve@hermannsand.com
Co-Chair – Michael Carpenter	(601) 638-5921 michael.carpenter@ergon.com
RIAC	
St. Louis District – Bernard Heroff	(314) 803-4644 (cell) (877) 855-7266 bernard.heroff@adm.com
St. Paul District – Lee Nelson	(651)260-0185 (cell) (651) 292-9293 lee@ursi.net
Rock Island District – Casey Herschler	(217) 257-1749 casey.herschler@gmail.com
USCG Sector Upper Mississippi River; St. Louis, MO	
Western Rivers Command Center (24/7)	1-866-360-3386 westernriverscc@uscg.mil
Sector Commander – CAPT Brandy Parker	(314) 269-2600 Brandy.n.parker@uscg.mil
Prevention Department Head/Waterways Management Division Chief – LCDR Nakia Bacon	(314) 704-7394 Nakia.d.bacon@uscg.mil
Waterways Management Division Watchstander (24/7)	(319) 520-8556 SUMRWaterways@uscg.mil
USCG Heartland District Bridge Branch; St. Louis, MO	
During normal working hours/ Duty Phone	(314) 269-2378/ (314) 299-4757
After normal working hours, call USCG Western Rivers Command Center	
Bridge branch email: STL-DG-ALL-D8-DWB@uscg.mil	
USACE Kansas City District	
Emergency Management Office (24/7)	(816) 426-6320
General Questions	(816) 389-2000
Chief, Operations Division – Stuart Cook	(816) 389-3342 (816) 289-7945 (cell) stuart.r.cook@usace.army.mil
Navigation Business Line Manager – Ted London	(816) 389-3259 ted.a.london@usace.army.mil

MOR Contact List	
Program Manager, Navigation Restoration – Clint Mason	(816) 389-3619 (816) 854-9919 (cell) clint.d.mason@usace.army.mil
Missouri River Area Office	
Missouri River Operations Project Manager – Mitch Roberts	(816) 316-6069 mitchell.w.roberts@usace.army.mil
Navigation Project Assistant – Dakota Meador	(816) 240-8131 dakota.a.meador@usace.army.mil
Channel Inspector – Robert Martens	(816) 389-3961 robert.e.martens@usace.army.mil
Survey Lead – Dan Curtin	(816) 389-2301 daniel.p.curtin@usace.army.mil
Engineering Division	
Chief, River Engineering & Restoration Section – Michael Gossenauer	(816) 389-3162 michael.b.gossenauer@usace.army.mil
Missouri River Technical Lead – Mike Chapman	(816) 389-3310 michael.d.chapman@usace.army.mil
Construction Division	
Resident Engineer, BSNP Office – Robin Perusich	(816) 389-3879 robin.d.wankum@usace.army.mil
USACE Omaha District	
Emergency Management Office (24/7)	(402) 995-2448
Alternate Phone	(402) 995-2229
Missouri River Project Office	(402) 996-3747
Missouri River Project Office Operations Project Manager – Chuck McWilliams	(402) 995-2319 charles.d.mcwilliams@usace.army.mil
Missouri River Project Office Technica Support Section Chief – Jeremy Szynskie	(402) 996-3769 jeremiah.j.szynskie@usace.army.mil
Missouri River Project Office River Maintenance Crew – Larry Morgan	(402) 996-3755 larry.e.morganjr@usace.army.mil

MOR Contact List	
Engineering Division – **USACE Omaha District**	
Chief, River & Reservoir Engineering Section – Christine Cieslik	(402) 995-2304 christine.k.cieslik@usace.arm.mil
Iowa Homeland Security & Emergency Management Department (HSLEM)	
Duty Officer	(515) 979-2200
Alternate Phone	(515) 725-3231
Kansas Emergency Management	
Emergency Management (24/7)	(785) 291-3333 (Option 2)
Missouri State Emergency Management Agency	
SEMA Telecommunications Center (24/7)	(573) 751-2748
Toll Free	(800) 298-6289
Nebraska State emergency Management Agency	
Emergency Management	(402) 471-7421
North Dakota Department of Emergency Services	
Duty Officer (24/7)	(701) 328-9921
South Dakota	
Emergency Management (24/7)	(605) 773-3231

MOR Website List	
INTERNET SITES	**ADDRESS**
USCG Sector Upper Mississippi River	https://www.atlanticarea.uscg.mil/Our-Organization/District-8/District-Units/Sector-Upper-Mississippi-River/ https://homeport.uscg.mil/port-directory/upper-mississippi-river-(st-louis)
USCG Bridge Program Division	https://www.dco.uscg.mil/Office-of-Bridge-Programs/
USACE Northwestern Division Water Management	http://www.nwd-mr.usace.army.mil/rcc/index.html
USACE Northwestern Missouri River Basin Update	https://www.nwd.usace.army.mil/MRWM/MRWMApp/
USACE Kansas City District	https://www.nwk.usace.army.mil/
USACE Omaha District Water Control	https://www.nwo.usace.army.mil/
USACE Missouri River Facebook Page	https://www.facebook.com/MORiverNavigation
NWS – National Weather Service	http://www.nws.noaa.gov/
NOAA – Weather Prediction Center	https://www.wpc.ncep.noaa.gov/
NWS – River Forecast Center	https://water.weather.gov/
USGS – Missouri River Gauge, Sioux City, Iowa (MM 732.2)	http://waterdata.usgs.gov/ne/nwis/uv?06486000
USGS – Missouri River Gauge, Decatur, Nebraska (MM 691.0)	http://waterdata.usgs.gov/ne/nwis/uv?06601200
USGS – Missouri River Gauge, Omaha, Nebraska (MM 615.9)	http://waterdata.usgs.gov/ne/nwis/uv?06610000
USGS – Missouri River Gauge, Nebraska City, NE (MM 562.6)	http://waterdata.usgs.gov/ne/nwis/uv?06807000
USGS – Missouri River Gauge, Rulo, Nebraska (MM 498.1)	http://waterdata.usgs.gov/ne/nwis/uv?06813500
USGS – Missouri River Gauge, St. Joseph, Missouri (MM 448.2)	http://waterdata.usgs.gov/mo/nwis/uv?06818000
USGS – Missouri River Gauge, Kansas City, Missouri (MM366.1)	http://waterdata.usgs.gov/mo/nwis/uv?06893000
USGS – Missouri River Gauge, Waverly, Missouri (MM293.4)	http://waterdata.usgs.gov/mo/nwis/uv?06895500
USGS – Missouri River Gauge, Glasgow, Missouri (MM226.3)	http://waterdata.usgs.gov/mo/nwis/uv?06906500
USGS – Missouri River Gauge, Boonville, Missouri (MM197.1)	http://waterdata.usgs.gov/mo/nwis/uv?06909000
USGS – Missouri River Gauge, Jefferson City, MO (MM 143.9)	http://waterdata.usgs.gov/mo/nwis/uv?06910450
USGS – Missouri River Gauge, Hermann, Missouri (MM 97.9)	http://waterdata.usgs.gov/mo/nwis/uv?06934500
USGS – Missouri River Gauge, St. Charles, Missouri (MM 28.2)	http://waterdata.usgs.gov/mo/nwis/uv?06935965
USGS – Mississippi River Gauge, St. Louis, Missouri (MM 190.2)	http://waterdata.usgs.gov/mo/nwis/uv?07010000
River Industry Bulletin Board	http://www.ribb.com/index.php

Section 4 – Action Plan Tables

The actions to be taken during High Water, Low Water and High Current conditions are described in the following Action Plan Tables. The Action Plan Tables are supplemented by Tables 1, 2 and 3. The supplemental tables provide specific MOR flood information and various stage and discharge information to provide a basis for use of the Action Plan Tables as well as an understanding of how the hazardous event compares historically. An Action Plan Table for Ice conditions is not provided since the MOR is not used by the navigation industry when ice forms, normally mid-December thru mid-March. In addition to the discussions on Tables 1, 2 and 3, there are discussions of Project Operations for the Missouri River Master Water Control Manual and Annual Operating Plan, and Project Operations for Buoying Recommendations for Minimum Service Flow Support.

Table 1

This table shows the US Geological Survey (USGS) historical maximum discharges from the reservoirs since the Missouri River System was fully operational in 1967. The maximum design discharge capacity of the dams as well as the USGS maximum recorded discharge near the dams is listed. In addition, the USGS maximum discharge of record with the dams in place since 1967 and the USGS maximum discharge of record for the downstream gaging stations from Sioux City downstream are shown.

Table 2

This table shows the Construction Reference Plane (CRP) stages and USGS discharges for the gaging stations from Sioux City to near the mouth at St. Charles. The CRP is a design profile used for constructing and maintaining the revetment and dike system. See glossary in the main report for detailed definition of CRP. Revisions to the CRP are required to reflect periodic changes within the basin due to flood events, channel degradation and aggradations and other river related circumstances. The Kansas City District updated the CRP for the Rulo to mouth reach in 2010. Omaha District updated the CRP for Sioux City to Rulo reach in 2006. Revisions impacting this Action Plan will be reflected in future updates. The CRP provides river users an approximate baseline for full-service navigation stages for the entire navigable river reach. Table 2 also shows the full-service navigation discharges at the four gauge locations that serve as flow targets. These targets are met by releasing appropriate flows from the reservoir system so that the discharge at each gaging station at least meets the flow target. One gaging station may just meet the target while the others may equal or exceed the target. Full-service navigation discharges provide for the 9 feet deep by minimum of 300 feet wide navigation channel. Minimum service navigation discharges are also listed for the same gauges. Minimum service navigation discharges provide for 8 feet deep by minimum of 200 feet wide navigation channel. Below Kansas City there are no navigation discharge flow targets established. Tributary flows generally supplement the flows downstream below Kansas City providing the required navigation flow support. Below Kansas City the USACE, USCG and towing industry use the CRP stages as an approximation of full-service navigation support as a comparison baseline. However, it must be noted that the discharges corresponding to the CRP stages are slightly higher than the full-service target discharge with the addition of normal tributary inflows from Kansas City to the mouth.

Table 3

This table shows the flood stages with discharges at the gaging stations from Sioux City to near the mouth at St. Charles. Also shown are the “extreme high water watch stages” at specific gaging stations. These watch stages are used as guidelines by the USACE in coordinated discussions with the USCG. The watch stages represent historic river levels where continuing river navigation would have impacted flood fighting activities, threatened levee integrity, or caused significant infrastructure damage along the river. Because

of development activity along the floodway, accretion in the floodway, and levee crest changes, these watch stages can change. However, these stages provide a reasonable reference to begin necessary actions to consider river safety zones or closings and openings. Field observations and experience will be used to update the stages.

PROJECT OPERATIONS – MISSOURI RIVER MASTER WATER CONTROL MANUAL AND ANNUAL OPERATING PLAN

Navigation support flows are initiated from Gavins Point Dam (R 811.1) on or about March 20th each year. There is about a 10-day lead time for releases from Gavins Point Dam to reach the mouth. These flows provide flow support for the calendar year navigation season, which normally runs from 1 April thru 30 November at the mouth of the Missouri River. To meet downstream flow support requirements navigation flow targets have been established at Sioux City, IA, Omaha & Nebraska City, NE and Kansas City, MO. Depending on the available system water supply these targets vary from 31,000 to 25,000 CFS at Sioux City, 31,000 to 25,000 CFS at Omaha, 37,000 to 31,000 CFS at Nebraska City and 41,000 to 35,000 CFS at Kansas City. The upper range is used when the system has normal to above normal water supply and the lower range, less 6000 CFS, is used during periods of low upstream system water supply during an extended drought. The full-service flow support level refers to the upper range and the minimum service flow support refers to the lowest range. Service between full and minimum is called intermediate service. The Missouri River Water Management team runs daily MOR forecasts and makes daily release changes if required to meet the required flow targets during the navigation season. During the nesting period of the threatened piping plover, mid-May to mid-August, releases from Gavins Point are scheduled using a "steady release – flow to target" procedure to minimize loss of nests due to reservoir operations or incidental take. The Incidental Take Statement is outlined in the 2018 Biological Opinion. Early in the nesting season, releases from Gavins Point are scheduled high enough to inundate low-lying habitat that would be subject to inundation later in the nesting season. As downstream tributary flows decline during the summer, releases from Gavins Point are increased as needed for downstream purposes such as navigation flow support. The season length is variable based on system water supply conditions as determined by the reservoir storage check on 1 July. The season length can be reduced no greater than two months. If an extended drought and usage of the system causes the system storage to be less than or equal to 31-million-acre feet, navigation for that year will not be supported by system releases. During years of above normal water supply the season is often extended to December 10th to provide additional floodwater evacuation to prepare the system for the following runoff season prior to winter freeze in.

PROJECT OPERATIONS – BUOYING RECOMMENDATIONS FOR MINIMUM SERVICE FLOW SUPPORT

Since the reservoir system was fully operational in 1967 there have been two major droughts, 1988 -1993 and 2000 - 2007. The first drought period, 1988-1993, provided the first opportunity to understand the performance of the navigation channel design during minimum service flow support. An USACE memo to the USCG, dated February 14, 1990, recommended buoying the river to provide an 8 feet deep channel within the widths available. During the March 26, 1990, Joint USACE and USCG Meeting, it was agreed that the USCG buoy to 8 feet deep, but it was also agreed that the USCG would consider issuing a Notice to Mariners of any areas with channel dimensions that were less than 8 feet x 200 feet. If the channel conditions could only support dimensions less than 8 feet x 150 feet, the USCG would consider establishing a Safety Zone for those reaches on a case-by-case basis. During the drought of 2000 - 2007 for minimum service flow support the same buoying and notification operations were implemented.

ACTION PLAN TABLE – HIGH WATER, Sioux City, IA to the Mouth MM 734.8 – 0.0

The Action Plan Table consists of seven tables that consider High Water for the seven reaches that divide up the navigation channel from Sioux City to the mouth. These reaches are the Sioux City Reach from river mile 734.8 to 630, the Omaha Reach from 630 to 500, the St. Joseph Reach from 500 to 400, the Kansas City Reach from river mile 400 to 300, the Brunswick Reach from river mile 300 to 200, the Jefferson Reach from river mile 200 to 100 and the Washington Reach from river mile 100 to 0.0. The tables show Trigger Readings for making decisions. These readings include flood stages and extreme high water watch stages that are also shown on Table 3.

In addition to the standard Action Plan Tables for High Water, a High-Water Stage Trigger Table is provided to help simplify the comparison between discharge, stage and the action decisions.

ACTION PLAN TABLE – LOW WATER & ICE CONDITIONS, Kansas City, MO to the Mouth MM 366.1 – 0.0

Low water is a significant issue for the reach from Kansas City to the mouth. River reaches upstream are supported by reservoir releases that provide the minimum required navigation flows. Low water is generally not an issue for the upstream reaches. However sometimes navigation target flows are slightly missed because of flow regulation for endangered species or unexpected reductions from tributary flows. Missing the target flow at the Kansas City gauge or low tributary drought influenced inflows impacts the reach downstream the most. Therefore, Action Plan Tables for Low Water include only the four reaches within Kansas City to the mouth. These reaches are the Kansas City Reach from river mile 366.1 to 300, the Brunswick Reach from river mile 300 to 200, the Jefferson Reach from river mile 200 to 100 and the Washington Reach from river mile 100 to 0.0. The Kansas City Reach begins at river mile 366.1 as this is the most downstream target gauge location for supporting navigation flows from the reservoir system. The lowest discharge Trigger Reading indicated for the Kansas City gauge for normal operations corresponds with minimum service navigation flows of 35,000 cubic feet per second (CFS). The falling water discharges at the Kansas City gauge corresponds to a missed target situation. The falling water discharges downstream are a result of a missed target at Kansas City and/or drought conditions on the tributaries. Mainstream river gauges that have locations that correspond to the upstream and downstream river mile positions for each river reach are used for Trigger Reading discharges. Ice conditions not only reduces water levels but causes ice to build up underneath barges causing them to "ground" without ever touching the river bottom. Ice navigation can be very difficult as the ice removes navigation buoys, causes ice gorges and damages the hulls of towing vessels and barges. The USCG will consider issuing a Marine Safety Information Bulletin (MSIB), with specific information regarding current conditions and recommended safety precautions that should be met when transiting through the ice impacted areas. USCG may impose waterway closures if the formation of large ice sheets poses a navigational risk.

The Action Plan Tables for Low Water include both discharge and gauge information. Although discharge is what maintains the channel, stage is most often used as a river flow benchmark. For any given river discharge the stage can fluctuate due to river sediment bed forms moving downstream. The stages provided for the low water table are the best average stage for the discharges indicated.

In addition to the standard Action Plan Tables for Low Water, a Low Water Trigger Table is provided to help simplify the comparison between discharge, stage and the action decisions.

ACTION PLAN TABLE – HIGH CURRENT, Sioux City, IA to the Mouth MM 734.8 – 0.0

The seven tables provided consider high current using high discharges caused by basin or regional flood events for the entire navigable river reach. These reaches are the Sioux City Reach from river mile 734.8 to 630, the Omaha Reach from 630 to 500, the St. Joseph Reach from 500 to 400, the Kansas City Reach from river mile 400 to 300, the Brunswick Reach from river mile 300 to 200, the Jefferson Reach from river mile 200 to 100 and the Washington Reach from river mile 100 to 0.0. The greatest concerns for the high and very high currents are those created by flood waters carried by the river. Experience indicates that although the greatest of these flows can be navigated against it will be other factors that make the decision to issue advisories or establish safety zones or river closures.

Individual tributaries can receive significant rain events that have currents reaching the confluence of the MOR that penetrate well into the channel. These situations provide high current navigation challenges for tows that pass a flooding tributary confluence. However, these are infrequent and short-lived events and the majority of tows safely pass on the opposite side of the river to avoid the side energy.

TABLE 1 – Reservoir and Channel Flood Discharge Records

Dam/Reservoir	State	Maximum Discharge Of Record With Dams 1967- Present (cfs)	Maximum Design Discharge Capacity (cfs)	Maximum Discharge Of Record Near Dams (cfs)
Fort Peck Dam - Fort Peck Lake	MT	65,900 (Jun 2011)	275,000	137,000 (Jun 1953)
Garrison Dam - Lake Sakakawea	ND	150,600 (Jun 2011)	827,000	348,000 (Apr 1952)
Oahe Dam - Lake Oahe	SD	160,300 (Jun 2011)	304,000	440,000 (Apr 1952)
Big Bend Dam - Lake Sharpe	SD	166,300 (Jun 2011)	390,000	440,000 (Apr 1952)
Fort Randall Dam - Lake Francis Case	SD	160,000 July 2011	620,000	447,000 (Apr 1952)
Gavins Point Dam - Lewis and Clark Lake	SD & NE	160,700 (Jun 2011)	584,000	480,000 (Apr 1952)
Gauge Location	**Mile Marker**	**Maximum Discharge Of Record With Dams 1967- Present (cfs)**		**Maximum Discharge of Record Prior to 1967 Before Dams Fully Operational (cfs)**
Sioux City, IA	732.3	192,000 (Jul 2011)		441,000 (Apr 1952)
Decatur, NE	691.0	191,000 ((Jun 2011))		NA*
Omaha, NE	615.9	217,000 (Jul 2011)		396,000 (Apr 1952)
Nebraska City, NE	562.6	229,000 (Jul 2011)		414,000 (Apr 1952)
Rulo, NE	498.1	328,000 (Jul 2011)		358,000 (Apr 1952)
St. Joseph, MO	448.2	335,000 (Jul 1993)		397,000 (Apr 1952)
Kansas City, MO	366.1	541,000 (Jul 1993)		625,000 (Jun 1844)
Waverly, MO	293.2	633,000 (Jul 1993)		549,000 (Jul 1951)
Boonville, MO	196.6	755,000 (Jul 1993)		710,000 (Jun 1844)
Hermann, MO	97.9	750,000 (Jul 1993)		700,000 (Jun 1844)

* NA – Not Applicable as there is not enough historic record

TABLE 2 – Construction Reference Plane Stage, Discharge & Navigation Service Discharge					
Gauge Location	**Mile Marker**	**2017 CRP Stage (ft)**	**Approximate Discharge at 2017 CRP Stage (cfs)**	**Full Service Navigation Discharge (cfs)**	**Minimum Service Navigation Discharge (cfs)**
Sioux City, IA	732.4	12.0	29,200	31,000	25,000
Decatur, NE	691.1	20.8	29,900		
Blair, NE	648.3	15.4	NA*		
Omaha, NE	616.0	15.1	37,700	31,000	25,000
Plattsmouth, NE	591.5	16.3	NA*		
Nebraska City, NE	562.6	9.9	37,100	37,000	31,000
Brownville, NE	535.3	25.1	NA*		
Rulo, NE	497.9	8.7	38,400		
St. Joseph, MO	448.2	8.0	40,100		
Atchison, KS	422.65	10.5	NA*		
Kansas City, MO	366.1	10.1	43,400	41,000	35,000
Napoleon, MO	328.6	7.6	NA*		
Waverly, MO	293.4	11.3	44,400	41,900***	39,000***
Miami, MO	262.6	8.6	NA*		
Glasgow, MO	226.4	12.0	NA*		
Boonville, MO	197.1	8.1	47,700	45,100***	42,000***
Jefferson City, MO	143.9	6.9	NA*		
Hermann, MO	97.9	6.3	55,600	52,700***	50,000***
Washington, MO	68.1	3.7	NA*		
St. Charles, MO	27.8	10.0	NA*		
Elevation Datum NAVD88					
* NA – Not Applicable					
***Navigation Targets not used below Kansas City. Calculated Full Service Flows and Minimum Service Flows					

TABLE 3 – Flood Stages and Extreme High Water Stages

Gauge Location	Mile Marker	Flood Stage (ft)	Approximate Flood Stage Discharge (cfs)	Extreme High Water Watch Stages (ft)	Extreme High Water Watch Discharge (cfs)
Sioux City, IA	732.3	30	134,000	30 & Above	134,000+
Decatur, NE	691.0	35	101,000	35	101,000
Blair, NE *	648.3	29	NA	29	NA
Omaha, NE	615.9	29	139,000	29 & Above	139,000+
Plattsmouth, NE *	591.5	26	NA	26	NA
Nebraska City, NE	562.6	18	80,700	17 & Above	74,000+
Brownville, NE *	535.3	32	NA	31 & Above	NA
Rulo, NE	498.0	17	84,000	17 & Above	84,000+
St. Joseph, MO	448.2	17	88,000	20 & Above	118,000+
Atchison, KS**	422.6	22	108,000	26 & Above	------
Kansas City, MO	366.1	32	231,000	35 & Above	274,000+
Napoleon, MO	328.7	17	107,000	------	------
Lexington, MO	317.3	22	110,000	------	------
Waverly, MO	293.2	20	114,000	25 & Above	167,000+
Miami, MO	262.6	18	128,000	25 & Above	185,000+
Glasgow, MO	226.3	25	147,000	27 & Above	204,000+
Boonville, MO	196.6	21	160,000	25 & Above	214,000+
Jefferson City, MO	143.9	23	182,000	26 & Above	238,000+
Gasconade Harbor	104.5	22	197,000	------	------
Hermann, MO	97.9	21	200,000	25 & Above	255,000+
Washington, MO	67.6	20	238,000	26 & Above	268,000+
St. Charles, MO	28.2	25	214,000	27 & Above	280,000+

* This Gauge is not rated

** The bridge tender for the Union Pacific RR Bridge at Atchison, KS may close the swingspan section when the Atchison river gauge reaches a stage of 26 feet with a rising river predicted. The concern is drift lodging into the bull gear of the center pier preventing the closing of the bridge to railroad traffic. The bridge tender checks for any nearby towboat traffic to coordinate the closing. See contact list for bridge tender information.

ACTION PLAN TABLES

The actions to be taken during High Water, Low Water, High Current, and Ice conditions are described in the following Action Plan Tables.

This Information is Applicable to ALL Tables

Issue advisories (e.g., BNM, LNM, MSIB, and/or AIS-Geographic Notice) to indicate extreme low water, high water, high flow, or ice conditions. Per 33 CFR § 165.20, USCG may establish safety zones "for safety or environmental purposes, access is limited to authorized persons, vehicles, or vessels. It may be stationary and described by fixed limits or it may be described as a zone around a vessel in motion." A safety zone may be initiated by the USCG or by any person under 33 CFR § 165.5.

In the event of an unexpected river closure, the following steps should be considered prior to reopening the river as appropriate:

- Conduct test tows if necessary for potential problem areas.
- Develop and initiate recovery plan to clear the queue.
- USCG and USACE will typically reset buoys in those narrow channel locations within reach and continue an increased level of channel reconnaissance to ensure vessel traffic is able to transit safely. USCG, USACE, and MRAC will coordinate vessel navigation protocols in situations where channel widths are temporarily reduced to below normal operating standards. These operations are suspended by the USCG after the end of the Navigation Season per the Light List.
- USCG and USACE will coordinate the use of electronic aids to navigation (e-ATON),[1] particularly in areas of emergent shoaling.
- MRAC will create/manage a queue of vessels meeting the maximum possible safe depth for northbound and southbound traffic.
- Consider draft limits, tow sizes, and helper boats.
- Evaluate fleet dimensions.
- Be aware of shifting channels.
- Emergency dredging may be required at some locations.

All the phases and actions listed in the tables below can be modified based on coordination between the USCG, USACE, and industry.

Vessels equipped with Azipods ("Z Drive") may generally be considered to have 20 percent more than their actual horsepower rating for DOWN BOUND tows.

[1] e-ATON are digital systems that enhance traditional physical ATONs. e-ATON provide navigational information using technologies such as AIS beacons, GPS, and digital charting systems. E-ATONs can transmit real-time data on location, weather conditions, tides, and hazards directly to vessels' navigation systems, increasing navigational accuracy and safety.

ACTION PLAN TABLE – HIGH WATER, ALL REACHES (MM 734.8 – 0.0)

This table contains the actions to be followed as the water levels rise to specific levels set for each reach. As the phases change from Normal to Watch, Action, and then Recovery, the following procedures apply. In the event that there are unique concerns for a specific reach(s), additional procedures for that reach(s) will be listed in the table.

- **Normal Operations (Rising Water)**
  - Monitor river gauges frequently
  - As stage rises toward flood stage, consider the need to initiate communications plan (refer to Section 3)
- **High Water (Watch Phase)**
  - Initiate communications plan (refer to Section 3)
  - Issue advisory that indicates high water and drift potential
  - Advise the use of caution and minimization of wake
  - Consider tow restrictions, HP requirements, and dangers of down streaming
  - Discuss mooring arrangements and bridge clearance issues
  - All tow boat operators should be experienced in high water operations
  - Consider the use of AIS-Geographic Notices to alert mariners to areas of high water
  - Consider issuance of advisories (BNM, MSIB) for river closure and no wake thresholds
- **Extreme High Water (Action Phase)**
  - Continue watch phase requirements
  - Analyze watch stage, high current reports, flood fighting reports, impacted river reaches, towboat positions, and levee conditions
  - Consider establishing Safety Zone to close river. If established, use BNM, MSIB, and/or AIS-Geographic Notices to inform mariners. Consider issuing press releases and distributing MSIBs to State/County EOC and State Boating Law Administrators to ensure awareness of recreational boaters
  - Consider press release and/or JIC and formation of Incident Command Post
  - Discourage or prohibit recreational vessel traffic
  - Prohibit laying up on levees
  - Assess bridge clearances in advance
  - Minimize speed to avoid wake and favor the center of the channel. Exercise caution in meeting/passing situations
  - Advise operators to pre-identify suitable layup areas.
  - Monitor fleeting areas and mooring lines/arrangements. Review anchoring requirements.
  - Coordinate with adjacent fleeters/facilities for assistance with breakaways
  - Advise caution due to swift current
- **High Water (Recovery Phase)**
  - Consider removing action phase requirements and analyze watch phase requirements for continued validity
  - Analyze watch stage, high current reports, flood fighting reports, impacted river reaches, towboat positions, and levee conditions
  - Determine which action advisories need to remain in place or can be removed
  - Consider the use of AIS broadcasted electronic aids to navigation and/or geographic notices in areas of emergent shoaling
  - Monitor conditions related to Safety Zone necessity
  - Update / issue advisory to indicate high water and use of caution
  - Report hazardous conditions to appropriate Coast Guard office (refer to Sections 2 & 3)
  - If stage rises, consider the need to initiate communications plan (refer to Section 3)
- **Normal Operations (Falling / Stable Water)**
  - Issue final advisory that indicates a return to Normal Operations

ACTION PLAN TABLE – HIGH WATER, Sioux City Reach MM 734.8 – 630.0					
CRITICAL LOCATION DESCRIPTION	**TRIGGER READING (Feet)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 734.8 – 630 **SIOUX CITY REACH** **Missouri River Gauges:** **Sioux City (SSCN1) MM 732.3** **Omaha (OMHN1) MM 615.9**	Sioux City Below 29.0 Omaha Below 26.0	Rising	Normal Operations		No additional actions
	Sioux City 29.0 to 30.0 Omaha 26.0 to 29.0	Rising	High Water	Watch	No additional actions
	Sioux City 30.0 and Above Omaha 29.0 and Above	Rising	Extreme High Water	Action	No additional actions
	Sioux City 30.0 to 29.0 Omaha 29.0 to 26.0	Falling	High Water	Recovery	No additional actions
	Sioux City Below 29.0 Omaha Below 26.0	Falling	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH WATER, Omaha Reach MM 630.0 – 500.0					
CRITICAL LOCATION DESCRIPTION	**TRIGGER READING (Feet)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 630 – 500 **OMAHA REACH** **Missouri River Gauges:** **Omaha (OMHN1) MM 615.9** **Rulo (RULN1) MM 498.0**	Omaha Below 26.0 Rulo Below 17.0	Rising	Normal Operations		No additional actions
	Omaha 26.0 to 29.0 Rulo 17.0 to 20.0	Rising	High Water	Watch	No additional actions
	Omaha 29.0 and Above Rulo 20.0 and Above	Rising	Extreme High Water	Action	No additional actions
	Omaha 29.0 to 26.0 Rulo 20.0 to 17.0	Falling	High Water	Recovery	No additional actions
	Omaha Below 26.0 Rulo Below 17.0	Falling	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH WATER, St. Joseph Reach MM 500.0 – 400.0					
CRITICAL LOCATION DESCRIPTION	**TRIGGER READING (Feet)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 500 – 400 **ST. JOSEPH REACH** **Missouri River Gauges:** **Rulo (RULN1) MM 498.0** **St. Joseph (SJSM7) MM 448.2** **Atchison (ATCK1) MM 422.6** **Kansas City (KCDM7) MM 366.1**	Rulo Below 17.0 St. Joseph Below 17.0 Atchison Below 22.0 Kansas City Below 32.0	Rising	Normal Operations		No additional actions
	Rulo 17.0 to 20.0 St. Joseph 17.0 to 20.0 Atchison 22.0 to 26.0 Kansas City 32.0 to 35.0	Rising	High Water	Watch	No additional actions
	Rulo 20.0 and Above St. Joseph 20.0 and Above Atchison 26.0 and Above Kansas City 35 and Above	Rising	Extreme High Water	Action	RR Bridge (MM 422.6) may close span
	Rulo 20.0 to 17.0 St. Joseph 20.0 to 17.0 Atchison 26.0 to 22.0 Kansas City 35.0 to 32.0	Falling	High Water	Recovery	No additional actions
	Rulo Below 17.0 St. Joseph Below 17.0 Atchison Below 22.0 Kansas City Below 32.0	Falling	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH WATER, Kansas City Reach MM 400.0 – 300.0					
CRITICAL LOCATION DESCRIPTION	**TRIGGER READING (Feet)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 400 – 300 **KANSAS CITY REACH** **Missouri River Gauges:** **Kansas City (KCDM7) MM 366.1** **Waverly (WVYM7) MM 293.2**	Kansas City 8.0 to 32.0 Waverly 10.2 to 22.0	Rising	Normal Operations		No additional actions
	Kansas City 32.0 to 35.0 Waverly 22.0 to 25.0	Rising	High Water	Watch	No additional actions
	Kansas City 35.0 and Above Waverly 25.0 and Above	Rising	Extreme High Water	Action	No additional actions
	Kansas City 35.0 to 32.0 Waverly 22.0	Falling	High Water	Recovery	No additional actions
	Kansas City 32.0 to 8.0 Waverly 22.0 to 10.2	Falling	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH WATER, Brunswick Reach MM 300.0 – 200.0					
CRITICAL LOCATION DESCRIPTION	**TRIGGER READING (Feet)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 300 – 200 **BRUNSWICK REACH** **Missouri River Gauges:** **Waverly (WVYM7) MM 293.2** **Miami (MIAM7) MM 262.6** **Glasgow (GLZM7) MM 226.3** **Boonville (BOZM7) MM 196.6**	Waverly 10.2 to 22.0 Miami Below 21.0 Glasgow Below 25.0 Boonville 7.0 to 21.0	Rising	Normal Operations		No additional actions
	Waverly 22.0 to 25.0 Miami 21.0 to 25.0 Glasgow 25.0 to 27.0 Boonville 21.0 to 25.0	Rising	High Water	Watch	No additional actions
	Waverly 25.0 and Above Miami 25.0 and Above Glasgow 27.0 and Above Boonville 25.0 and Above	Rising	Extreme High Water	Action	No additional actions
	Waverly 25.0 to 22.0 Miami 25.0 to 21.0 Glasgow 27.0 to 25.0 Boonville 25.0 to 21.0	Falling	High Water	Recovery	No additional actions
	Waverly 22.0 to 10.2 Miami Below 21.0 Glasgow Below 25.0 Boonville 21.0 to 7.0	Falling	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH WATER, Jefferson Reach MM 200.0 – 100.0					
CRITICAL LOCATION DESCRIPTION	**TRIGGER READING (Feet)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 200 – 100 **JEFFERSON REACH** **Missouri River Gauges:** **Boonville (BOZM7) MM 196.6** **Jefferson City (JFFM7) MM 143.9** **Hermann (HRNM7) MM 97.9**	Boonville 7.0 to 21.0 Jefferson City Below 23.0 Hermann 6.0 to 21.0	Rising	Normal Operations		No additional actions
	Boonville 21.0 to 25.0 Jefferson City 23.0 to 26.0 Hermann 21.0 to 25.0	Rising	High Water	Watch	No additional actions
	Boonville 25.0 and Above Jefferson City 26.0 and Above Hermann 25.0 and Above	Rising	Extreme High Water	Action	No additional actions
	Boonville 25.0 to 21.0 Jefferson City 26.0 to 23.0 Hermann 25.0 to 21.0	Falling	High Water	Recovery	No additional actions
	Boonville 21.0 to 7.0 Jefferson City Below 23.0 Hermann 21.0 to 6.0	Falling	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH WATER, Washington Reach MM 100.0 – 0.0					
CRITICAL LOCATION DESCRIPTION	**TRIGGER READING**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 100 – 0 **WASHINGTON REACH** **Missouri River Gauges:** **Hermann (HRNM7) MM 97.9** **Washington (WHGM7) MM 67.6** **St. Charles (SCLM7) MM 28.2**	Hermann 6.0 to 21.0 Washington Below 20.0 St. Charles Below 25.0	Rising	Normal Operations		No additional actions
	Hermann 21.0 to 25.0 Washington 20 to 26.0 St. Charles 25.0 to 27.0	Rising	High Water	Watch	No additional actions
	Hermann 25.0 and Above Washington 26 and Above St. Charles 27.0 and Above	Rising	Extreme High Water	Action	No additional actions
	Hermann 25.0 to 21.0 Washington 26.0 to 20.0 St. Charles 27.0 to 25.0	Falling	High Water	Recovery	No additional actions
	Hermann 21.0 to 6.0 Washington Below 20.0 St. Charles Below 25.0	Falling	Normal Operations	Recovery	No additional actions

MISSOURI RIVER WAP ANNEX HIGH WATER STAGE TRIGGER TABLE – 2020 Version

RISING GAUGE READING***					6:00 am NWS	National Weather Service Forecast – 6 am & 5 day				
Reach	Gauge Location	Trigger Stage Reading (ft)* Normal Operations	High Water (Watch)	Extreme High Water (Action)	Gauge Stage Today (ft) date	Gauge Stage Forecast (ft) date	Gauge Stage Forecast (ft) date	Gauge Stage Forecast (ft) date	Gauge Stage Forecast (ft) date	Gauge Stage Forecast (ft) date
SIOUX CITY REACH	Sioux City	< 29	29 - 30	> 30						
MM 734.8 - 630	Omaha	< 26	26 - 29	> 29						
OMAHA REACH	Omaha	< 26	26 - 29	> 29						
MM 630 - 500	Rulo	< 17	17 - 20	> 20						
ST JOSEPH REACH	Rulo	< 17	17 - 20	> 20						
MM 500 - 400	St. Joseph	< 17	17 - 20	> 20						
	Atchison	< 22	22 - 26	> 26						
	Kansas City	< 32	32 - 35	> 35						
KANSAS CITY REACH	Kansas City	8 - 32	32 - 35	> 35						
MM 400 - 300	Waverly	10.2 - 22	22 - 25	> 25						
BRUNSWICK REACH	Waverly	10.2 - 22	22 - 25	> 25						
MM 300 - 200	Miami	< 21	21 - 25	> 25						
	Glasgow	< 25	25 - 27	> 27						
	Boonville	7 - 21	21 - 25	> 25						
JEFFERSON REACH	Boonville	7 - 21	21 - 25	> 25						
MM 200 - 100	Jefferson City	< 23	23 - 26	> 26						
	Hermann	6 - 21	21 - 25	> 25						
HERMANN REACH	Hermann	6 - 21	21 - 25	> 25						
MM 100 - 0	Washington	< 20	20 - 26	> 26						
	St. Charles	< 25	25 - 27	> 27						

* NOTE: For Falling Gauge Reading Review the Table Columns from Right to Left

**NOTE: Color Code the today and forecasted stage readings for Visual Display

***NOTE: Trigger Stages are informational and not used as absolute decision points

Normal Operations**

High Water**

Extreme High Water**

No Action

ACTION PLAN TABLE – LOW WATER, ALL REACHES

This table contains the actions to be followed as the water levels fall to specific levels set for each reach. As the phases change from Normal to Watch, Action, and then Recovery, the following procedures apply. In the event that there are unique concerns for a specific reach(s), additional procedures for that reach(s) will be listed in the table.

- **Normal Operations (Falling Water)**
  - Monitor river gauges frequently
  - As stage falls toward low water stage, consider the need to initiate communications plan (refer to Section 3)
  - USACE to plan additional channel reconnaissance surveys
  - Prohibit laying up on levees
- **Low Water (Watch Phase)**
  - Initiate communications plan (refer to Section 3)
  - Issue advisory that indicates low water
  - Advise the use of caution
  - Consider tow restrictions
  - USACE initiates increased channel reconnaissance surveys
- **Extreme Low Water (Action Phase)**
  - Issue advisory that indicates extreme low water
  - USCG will reset buoys in narrow channel locations within reach
  - USACE will continue increased level of channel reconnaissance
  - Emergency dredging may be required at some locations
  - Consider press release and/or JIC and formation of Incident Command Post
- **Extreme Low Water (Recovery Phase)**
  - USCG will monitor buoys in narrow channel locations within reach
  - USACE will continue increased level of channel reconnaissance
  - Emergency dredging may be required at some locations
- **Low Water (Recovery Phase)**
  - Issue advisory that indicates changes from extreme low water to low water
  - USACE will continue increased level of channel reconnaissance
- **Normal Operations (Falling / Stable Water)**
  - Issue final advisory that indicates a return to Normal Operations
  - Users to report hazardous conditions to USCG

ACTION PLAN TABLE – LOW WATER, Kansas City Reach 366.1 - 300						
CRITICAL REACH DESCRIPTION	**TRIGGER READING DISCHARGE**	**TRIGGER READING STAGE (FEET)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 400 – 300 **KANSAS CITY REACH** **Missouri River Gauges:** **Kansas City (KCDM7) MM 366.1** **Waverly (WVYM7) MM 293.2**	Kansas City 35,000 cfs	Kansas City 32.0 to 8.0	Falling	Normal Operations		No additional actions
	Waverly 39,000 cfs	Waverly Above 22.0 to 10.2				
	Kansas City 34,000 cfs	Kansas City 8.0 to 7.8	Falling	Low Water	Watch	No additional actions
	Waverly 37,000 cfs	Waverly 10.2 to 10.0				
	Kansas City < 34,000 cfs	Kansas City 7.8 and Below	Falling	Extreme Low Water	Action	No additional actions
	Waverly < 37,000 cfs	Waverly 10.0 and Below				
	Kansas City < 34,000 cfs	Kansas City 7.8 and Below	Rising	Extreme Low Water	Recovery	No additional actions
	Waverly < 37,000 cfs	Waverly 10.0 and Below				
	Kansas City 34,000 cfs	Kansas City 7.8 to 8.0	Rising	Low Water	Recovery	No additional actions
	Waverly 37,000 cfs	Waverly 10.0 to 10.2				
	Kansas City 35,000 cfs	Kansas City 8.0 to 32.0	Rising	Normal Operations	Recovery	No additional actions
	Waverly 39,000 cfs	Waverly 10.2 to 22.0				

ACTION PLAN TABLE – LOW WATER, Brunswick Reach 300 - 200						
CRITICAL REACH DESCRIPTION	**TRIGGER READING DISCHARGE**	**TRIGGER READING STAGE (FEET)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 300 – 200 **BRUNSWICK REACH** **Missouri River Gauges:** **Waverly (WVYM7) MM 293.2** **Boonville (BOZM7) MM 196.6**	Waverly 39,000 cfs	Waverly 22.0 to 10.2	Falling	Normal Operations		No additional actions
	Boonville 42,000 cfs	Boonville 21.0 to 7.0				
	Waverly 37,000 cfs	Waverly 10.2 to 10.0	Falling	Low Water	Watch	No additional actions
	Boonville 40,000 cfs	Boonville 7.0 to 6.5				
	Waverly < 37,000 cfs	Waverly 10.0 and Below	Falling	Extreme Low Water	Action	No additional actions
	Boonville < 40,000 cfs	Boonville 6.5 and Below				
	Waverly < 37,000 cfs	Waverly 10.0 and Below	Rising	Extreme Low Water	Recovery	No additional actions
	Boonville < 40,000 cfs	Boonville 6.5 and Below				
	Waverly 37,000 cfs	Waverly 10.0 to 10.2	Rising	Low Water	Recovery	No additional actions
	Boonville 40,000 cfs	Boonville 6.5 to 7.0				
	Waverly 39,000 cfs	Waverly 10.2 to 22.0	Rising	Normal Operations	Recovery	No additional actions
	Boonville 42,000 cfs	Boonville 7.0 to 21.0				

ACTION PLAN TABLE – LOW WATER, Jefferson Reach 200 - 100						
CRITICAL REACH DESCRIPTION	**TRIGGER READING DISCHARGE**	**TRIGGER READING STAGE (FEET)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 200 – 100 **JEFFERSON REACH** **Missouri River Gauges:** **Boonville (BOZM7) MM 196.6** **Hermann (HRNM7) MM 97.9**	Boonville 42,000 cfs	Boonville 21.0 to 7.0	Falling	Normal Operations		No additional actions
	Hermann 50,000 cfs	Hermann 21.0 to 6.0				
	Boonville 40,000 cfs	Boonville 7.0 to 6.5	Falling	Low Water	Watch	No additional actions
	Hermann 47,000 cfs	Hermann 6.0 to 5.2				
	Boonville < 40,000 cfs	Boonville 6.5 and Below	Falling	Extreme Low Water	Action	No additional actions
	Hermann < 47,000 cfs	Hermann 5.2 and Below				
	Boonville < 40,000 cfs	Boonville 6.5 and Below	Rising	Extreme Low Water	Recovery	No additional actions
	Hermann < 47,000 cfs	Hermann 5.2 and Below				
	Boonville 40,000 cfs	Boonville 6.5 to 7.0	Rising	Low Water	Recovery	No additional actions
	Hermann 47,000 cfs	Hermann 5.2 to 6.0				
	Boonville 42,000 cfs	Boonville 7.0 to 21.0	Rising	Normal Operations	Recovery	No additional actions
	Hermann 50,000 cfs	Hermann 6.0 to 21.0				

ACTION PLAN TABLE – LOW WATER, Washington Reach 100 – 0.0						
CRITICAL REACH DESCRIPTION	**TRIGGER READING DISCHARGE**	**TRIGGER READING STAGE (FEET)**	**TREND**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 100 – 0 **WASHINGTON REACH** **Missouri River Gauge:** **Hermann (HRNM7) MM 97.9**	Hermann 50,000 cfs	Hermann 21.0 to 6.0	Falling	Normal Operations		No additional actions
	Hermann 47,000 cfs	Hermann 6.0 to 5.2	Falling	Low Water	Watch	No additional actions
	Hermann < 47,000 cfs	Hermann 5.2 and Below	Falling	Extreme Low Water	Action	No additional actions
	Hermann < 47,000 cfs	Hermann 5.2 and Below	Rising	Extreme Low Water	Recovery	No additional actions
	Hermann 47,000 cfs	Hermann 5.2 to 6.0	Rising	Low Water	Recovery	No additional actions
	Hermann 50,000 cfs	Hermann 6.0 to 21.0	Rising	Normal Operations	Recovery	No additional actions

MISSOURI RIVER WAP ANNEX LOW WATER DISCHARGE & STAGE TRIGGER TABLE – (2020)

FALLING GAUGE READING***

Gauge Location	Minimum Service Navigation Discharge & Stage**		Normal Operations		WATCH PHASE Low Water		ACTION PHASE Extreme Low Water	
	(cfs)	(ft)	(cfs)	(ft)	(cfs)	(ft)	(cfs)	(ft)
Kansas City (MM 366.1)	35,000*	8.0	35,000 +	8.0 +	35,000 - 34,000	8.0 – 7.8	< 34,000	< 7.8
Waverly (MM 293.2)	NA	NA	39,000 +	10.2 +	39,000 - 37,000	10.2 – 10	< 37,000	< 10
Boonville (MM 196.6)	NA	NA	42,000 +	7.0 +	42,000 - 40,000	7.0 – 6.5	< 40,000	< 6.5
Hermann (MM 97.9)	NA	NA	50,000 +	6.0 +	50,000 - 47,000	6.0 – 5.2	< 47,000	< 5.2

RISING GAUGE READING***

Gauge Location	RECOVERY PHASES: Extreme Low Water		Low Water		Normal Operations		Minimum Service Navigation Discharge & Stage	
	(cfs)	(ft)	(cfs)	(ft)	(cfs)	(ft)	(cfs)	(ft)
Kansas City (MM 366.1)	< 34,000	< 7.8	34,000 - 35,000	7.8 – 8.0	35,000 +	8.0 +	35,000*	8.0
Waverly (MM 293.2)	< 37,000	< 10	37,000 - 39,000	10 – 10.2	39,000 +	10.2 +	NA	NA
Boonville (MM 196.6)	< 40,000	< 6.5	40,000 - 42,000	6.5 – 7.0	42,000 +	7.0 +	NA	NA
Hermann (MM 97.9)	< 47,000	< 5.2	47,000 - 50,000	5.2 – 6.0	50,000 +	6.0 +	NA	NA

*NOTE: The minimum navigation service flow target for Kansas City is 35,000 cubic feet per second. This flow is usually met throughout the navigation season. However, during the nesting season for the endangered shore birds, the piping plover and the interior least tern, constant Gavins Point Dam releases are made. These flows are usually high enough to provide the necessary flow targets. Occasionally drought conditions in the lower basin cause the target to be missed. If water is available in the Kansas state reservoirs, they can be used to assist in meeting the necessary target flow at Kansas City.

**NOTE: River stages fluctuate for the same river discharge. The stages listed for the discharges shown are based on analysis of the river Stage discharge relationships during the 2007 Navigation year with updates from the 2010 CRP results.

***NOTE: Trigger Gauge Readings are informational and not used as absolute decision points

MISSOURI RIVER WAP ANNEX LOW WATER DISCHARGE & STAGE TRIGGER FORECAST TABLE

Gauge Location	Gauge Discharge Today's date	Gauge Discharge Forecast date	Gauge Discharge Forecast date	Gauge Discharge Forecast date	Gauge Discharge Forecast date	Gauge Discharge Forecast date	Gauge Discharge Forecast date	Gauge Discharge Forecast date
Kansas City (MM 366.1)								
Waverly (MM 293.4)								
Boonville (MM 197.1)								
Hermann (MM 97.9)								

Gauge Location	Gauge Stage Today's date	Gauge Stage Forecast date	Gauge Stage Forecast date	Gauge Stage Forecast date	Gauge Stage Forecast date	Gauge Stage Forecast date	Gauge Stage Forecast date	Gauge Stage Forecast date
Kansas City (MM 366.1)								
Waverly (MM 293.4)								
Boonville (MM 197.1)								
Hermann (MM 97.9)								

	Normal Operations
	Low Water
	Extreme Low Water

ACTION PLAN TABLE – HIGH CURRENT, ALL REACHES

This table contains the actions to be followed as the water flow rates rise to specific levels set for each reach. As the phases change from Normal to Watch, Action, and then Recovery, the following procedures apply. In the event that there are unique concerns for a specific reach(s), additional procedures for that reach(s) will be listed in the table.

- **Normal Operations (Rising Flow Rate)**
  - Monitor river gauges frequently
  - As current rises toward trigger level, consider the need to initiate communications plan (refer to Section 3)
- **High Current (Watch Phase)**
  - Initiate communications plan (refer to Section 3)
  - Consider advisory that indicates high current and drift
  - Begin assessments of hazardous conditions
  - Consider tow size restrictions and HP requirements
  - Be cautious of terminal accessibility
- **Very High Current (Action Phase)**
  - Analyze high current reports, extreme high water reports, flood fighting reports, impacted river reaches, towboat positions, and levee conditions
  - Consider establishment of Safety Zone to close river.
  - Consider press release and/or JIC and formation of Incident Command Post
- **Very High Current (Recovery Phase)**
  - Consider revisions to advisory
  - ~~o~~ Consider the need for continued Safety Zone
  - Continue to report hazardous conditions
- **High Current (Recovery Phase)**
  - Consider revisions to advisory
  - Report hazardous conditions
  - Consider tow size restrictions and HP requirements
- **Normal Operations (Falling / Stable Water)**
  - Issue final advisory that indicates a return to Normal Operations
  - Users to report hazardous conditions to USCG

ACTION PLAN TABLE – HIGH CURRENT, Sioux City Reach MM 734.8 – 630.0					
CRITICAL REACH DESCRIPTION	**TREND**	**TRIGGER CURRENT**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 734.8 – 630 **SIOUX CITY REACH** **Missouri River Gauges:** **Sioux City (SSCN1) MM 732.3** **Omaha (OMHN1) MM 615.9**	Rising	Sioux City 31,000 cfs Omaha 31,000 cfs	Normal Operations		No additional actions
	Rising	Sioux City 70,000 cfs Omaha 75,000 cfs	High Current	Watch	No additional actions
	Rising	Sioux City 90,000 cfs Omaha 100,000 cfs	Very High Current	Action	No additional actions
	Falling	Sioux City 90,000 cfs Omaha 100,000 cfs	Very High Current	Recovery	No additional actions
	Falling	Sioux City 70,000 cfs Omaha 75,000 cfs	High Current	Recovery	No additional actions
	Falling	Sioux City 31,000 cfs Omaha 31,000 cfs	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH CURRENT, Omaha Reach MM 630.0 – 500.0

CRITICAL REACH DESCRIPTION	TREND	TRIGGER CURRENT	DESCRIPTION	PHASE	ACTION
Mile Marker 630 – 500 **OMAHA REACH** **Missouri River Gauges:** **Omaha (OMHN1) MM 615.9** **Rulo (RULN1) MM 498.0**	Rising	Omaha 31,000 cfs Rulo 39,000 cfs	Normal Operations		No additional actions
	Rising	Omaha 75,000 cfs Rulo 84,000 cfs	High Current	Watch	No additional actions
	Rising	Omaha 100,000 cfs Rulo 110,000 cfs	Very High Current	Action	No additional actions
	Falling	Omaha 100,000 cfs Rulo 110,000 cfs	Very High Current	Recovery	No additional actions
	Falling	Omaha 75,000 cfs Rulo 84,000 cfs	High Current	Recovery	No additional actions
	Falling	Omaha 31,000 cfs Rulo 39,000 cfs	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH CURRENT, St. Joseph Reach MM 500.0 – 400.0

CRITICAL REACH DESCRIPTION	TREND	TRIGGER CURRENT	DESCRIPTION	PHASE	ACTION
Mile Marker 500 – 400 **ST. JOSEPH REACH** **Missouri River Gauges:** **Rulo (RULN1) MM 498.0** **Kansas City (KCDM7) MM 366.1**	Rising	Rulo 39,000 cfs Kansas City 41,000 cfs	Normal Operations		No additional actions
	Rising	Rulo 84,000 cfs Kansas City 110,000 cfs	High Current	Watch	No additional actions
	Rising	Rulo 110,000 cfs Kansas City 160,000 cfs	Very High Current	Action	No additional actions
	Falling	Rulo 110,000 cfs Kansas City 160,000 cfs	Very High Current	Recovery	No additional actions
	Falling	Rulo 84,000 cfs Kansas City 110,000 cfs	High Current	Recovery	No additional actions
	Falling	Rulo 39,000 cfs Kansas City 41,000 cfs	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH CURRENT, Kansas City Reach MM 400.0 – 300.0					
CRITICAL REACH DESCRIPTION	**TREND**	**TRIGGER CURRENT**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 400 – 300 **KANSAS CITY REACH** **Missouri River Gauges:** **Kansas City (KCDM7) MM 366.1** **Waverly (WVYM7) MM 293.2**	Rising	Kansas City 41,000 cfs Waverly 45,000 cfs	Normal Operations		No additional actions
	Rising	Kansas City 110,000 cfs Waverly 114,000 cfs	High Current	Watch	No additional actions
	Rising	Kansas City 160,000 cfs Waverly 167,000 cfs	Very High Current	Action	No additional actions
	Falling	Kansas City 160,000 cfs Waverly 167,000 cfs	Very High Current	Recovery	No additional actions
	Falling	Kansas City 110,000 cfs Waverly 114,000 cfs	High Current	Recovery	No additional actions
	Falling	Kansas City 41,000 cfs Waverly 45,000 cfs	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH CURRENT, Brunswick Reach MM 300.0 – 200.0					
CRITICAL REACH DESCRIPTION	**TREND**	**TRIGGER CURRENT**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 300 – 200 **BRUNSWICK REACH** **Missouri River Gauges:** **Waverly (WVYM7) MM 293.2** **Boonville (BOZM7) MM 196.6**	Rising	Waverly 45,000 cfs Boonville 48,000 cfs	Normal Operations		No additional actions
	Rising	Waverly 114,000 cfs Boonville 160,000 cfs	High Current	Watch	No additional actions
	Rising	Waverly 167,000 cfs Boonville 214,000 cfs	Very High Current	Action	No additional actions
	Falling	Waverly 167,000 cfs Boonville 214,000 cfs	Very High Current	Recovery	No additional actions
	Falling	Waverly 114,000 cfs Boonville 160,000 cfs	High Current	Recovery	No additional actions
	Falling	Waverly 45,000 cfs Boonville 48,000 cfs	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH CURRENT, Jefferson Reach MM 200.0 – 100.0					
CRITICAL REACH DESCRIPTION	**TREND**	**TRIGGER CURRENT**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 200 – 100 **JEFFERSON REACH** **Missouri River Gauges:** **Boonville (BOZM7) MM 196.6** **Hermann (HRNM7) MM 97.9**	Rising	Boonville 48,000 cfs Hermann 56,000 cfs	Normal Operations		No additional actions
	Rising	Boonville 160,000 cfs Hermann 200,000 cfs	High Current	Watch	No additional actions
	Rising	Boonville 214,000 cfs Hermann 255,000 cfs	Very High Current	Action	No additional actions
	Falling	Boonville 214,000 cfs Hermann 255,000 cfs	Very High Current	Recovery	No additional actions
	Falling	Boonville 160,000 cfs Hermann 200,000 cfs	High Current	Recovery	No additional actions
	Falling	Boonville 48,000 cfs Hermann 56,000 cfs	Normal Operations	Recovery	No additional actions

ACTION PLAN TABLE – HIGH CURRENT, Washington Reach MM 100.0 – 0.0					
CRITICAL REACH DESCRIPTION	**TREND**	**TRIGGER CURRENT**	**DESCRIPTION**	**PHASE**	**ACTION**
Mile Marker 100 – 0 **WASHINGTON REACH** **Missouri River Gauges:** **Hermann (HRNM7) MM 97.9** **St. Charles (SCLM7) MM 28.2**	Rising	Hermann 56,000 cfs St. Charles 57,000 cfs	Normal Operations		No additional actions
	Rising	Hermann 200,000 cfs St. Charles 214,000 cfs	High Current	Watch	No additional actions
	Rising	Hermann 255,000 cfs St. Charles 280,000 cfs	Very High Current	Action	No additional actions
	Falling	Hermann 255,000 cfs St. Charles 280,000 cfs	Very High Current	Recovery	No additional actions
	Falling	Hermann 200,000 cfs St. Charles 214,000 cfs	High Current	Recovery	No additional actions
	Falling	Hermann 56,000 cfs St. Charles 57,000 cfs	Normal Operations	Recovery	No additional actions

Appendix A – Fleet Area Management Guidelines

Sector Upper Mississippi River Fleet Area Management Guidelines

Environmental compliance, safety, and security are integral parts of the day-to-day operations as a standard in the river industry. Barge breakaways are an all too common event on the Western Rivers, and frequently occur in high water, high winds, or icing conditions. Breakaways pose significant safety and environmental risks, and cause economic disruption for third parties who must avoid or help retrieve adrift barges. There are numerous fleeting areas located throughout Sector Upper Mississippi River's area of responsibility on the Mississippi, Missouri, and Illinois Rivers, including approximately eighty-one (81) fleeting areas throughout the St. Louis harbor.

The purpose of this document is to reduce the frequency of barge breakaways through the incorporation of best marine practices of fleet management during extreme river conditions. It should be clear that all fleets have different dynamics that affect them. It is the responsibility of each company to know how their fleets react to these conditions, and make all reasonable efforts to maintain them accordingly. The USCG and USACE will communicate and coordinate any actions that should be implemented when river conditions change through the River Industry Advisory Committee (RIAC), Illinois River Carrier's Association (IRCA), Missouri River Action Committee (MRAC), and through radio broadcast notices to mariners.

The following best practices should be considered when operating fleets during extreme river conditions. Examples of extreme river conditions are:

- *Rapid rise or fall of the river level*
- *Heavy drift or ice flows*
- *Violent weather conditions*
- *Extreme high or low river levels*

1. Be familiar with and adhere to the St. Louis area Waterways Action Plan (WAP) and advisories. Members of the Association should make all reasonable efforts to participate in meetings/conference calls when extreme conditions are experienced.

2. Take action to minimize the effects of drift and ice accumulations on the fleets. Good communication should be made throughout the harbor, especially downriver fleets, prior to de-drifting or deicing activities.

3. Closely monitor tows transiting the harbor during extreme conditions to avoid excessive wake and/or turbulence issues.

4. Ensure crews meet at crew change to discuss the river conditions and the condition of each fleet.

5. Apply extra rigging or if necessary "narrow" the fleets.

6. Increase their fleet surveillance and mooring inspections to identify potential issues and take immediate action to correct.

7. In the event of emergency (such as a tow break-up or fleet breakaway), take immediate action to secure the breakaway; report each breakaway as soon as possible to the Captain of the Port (COTP) by telephone, radio, or other means of rapid communication.

8. For St. Louis Harbor, in the event of an emergency, the St. Louis Association should appoint one of the companies who have 24 hour dispatchers to keep the USCG Command Center appraised of the situation until the vessels involved in the emergency can talk to them directly.

Appendix B – MOR ATON Prioritization (2026)

Electronic ATON – Automatic Identification System (AIS) ATON.
Navigational and/or Marine Safety Information can be transmitted via VHF-radio broadcast from base stations located throughout the Western Rivers. Two networks exist to transmit this information, the National Automatic Identification System (NAIS) owned by the Coast Guard, and the Lock Operations Management Application (LOMA) owned by the Army Corps of Engineers. Currently, only the LOMA system has the capability to broadcast AIS-ATON throughout the Western Rivers. A list of these base stations is contained in the USCG Light List, these stations are limited by antenna range and signal capacity. Therefore, AIS-ATON are customarily employed as a temporary substitute for insufficient physical ATON to address emergent hazardous river conditions. **To request the establishment and/or discontinuance of AIS-ATON, contact the respective Coast Guard Sector Waterways Management Office or the respective Army Corps District Channel Maintenance Office.**

Physical ATON – Fixed Day beacons and Lights.
The Fixed ATON system on the Western Rivers is comprised of day beacons and lights in the form of Crossing Marks and Passing Marks. These marks are non-lateral, indicate changes in the channel, and are typically found at bends in the river. A list of these ATON is contained in the USCG Light List; these aids are considered permanent. The Coast Guard Heartland District is responsible for the establishment of these ATON and the Cutters employed within the Western Rivers Sectors are responsible for maintaining these ATON**. To request changes to fixed ATON, contact the respective Coast Guard Sector Waterways Management Office. To report discrepancies, contact the Coast Guard Western Rivers Command Center.**

Physical ATON – Buoys.
Red Nun and Green Can Buoys are lateral aids used to mark the left and right edge of the navigation channel. They are normally set at the designated project depth and adjusted to account for forecasted fluctuation in river stage, however, in some cases the depths may be adjusted to accommodate industry loading concerns. The buoys are considered expendable, typically suffer a high loss rate, and therefore are not numbered or cataloged in the USCG Light List. The Cutters employed within the Western Rivers Sectors are responsible for the establishment and maintenance of these ATON. **To report discrepancies, contact the Coast Guard Western Rivers Command Center.**

Appendix C – BNM Templates

HIGH WATER WATCH

A. THE FOLLOWING REACHES ARE IN THE HIGH WATER WATCH PHASE IN ACCORDANCE WITH THE WESTERN RIVERS WAP ANNEX.
1. SIOUX CITY REACH (MM 630-734.8).
B. ALL TOWBOAT OPERATORS SHOULD USE CAUTION, MINIMIZE WAKE WHERE POSSIBLE AND BE EXPERIENCED IN HIGH WATER OPERATIONS. HIGH WATER AND DRIFT COULD BE EXPERIENCED. EXERCISE CAUTION DURING DOWN STREAMING OPERATIONS AND BE AWARE OF BRIDGE CLEARANCES.

HIGH WATER ACTION

A. THE FOLLOWING REACHES ARE IN THE HIGH WATER ACTION PHASE IN ACCORDANCE WITH THE WESTERN RIVERS WAP ANNEX.
1. BRUNSWICK (MM 200-300).
B. ALL TOWBOAT OPERATORS SHOULD USE CAUTION, MINIMIZE WAKE WHERE POSSIBLE, AND BE EXPERIENCED IN HIGH WATER OPERATIONS. HIGH WATER AND DRIFT COULD BE EXPERIENCED. EXERCISE CAUTION DURING DOWN STREAMING OPERATIONS AND BE AWARE OF BRIDGE CLEARANCES. RECREATIONAL TRAFFIC IS HIGHLY DISCOURAGED. MARINERS SHOULD FAVOR THE CENTER OF THE CHANNEL AND AVOID LAYING UP ON LEVEES. FLEETING AREAS SHOULD HAVE A TOWBOAT ATTEND FLEETS AT ALL TIMES AND HAVE A BREAKAWAY PLAN IN PLACE. MARINERS ARE ENCOURAGED TO PRE-IDENTIFY LAY-UP AREAS IN AN EVENT OF RIVER CLOSURE.