Arkansas River Basin

US Army Corps of Engineers®
Albuquerque District

2020 Water Management and Civil Works Activities

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Contents

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1. General

During Compact Year 2020 (1 November 2019 – 31 October 2020), activities of the U.S. Army Corps of Engineers (USACE), Albuquerque District, in the Arkansas River Basin consisted of water management, operations and maintenance, civil works, flood risk management, compliance with Section 404 of the Clean Water Act, and post wildfire flooding concerns.

2. Water Management Operations

In 2020, the Arkansas River Basin snowmelt forecast was well below normal throughout much of the basin. As of May 1st, the overall basin wide snowpack was reported as below average at 81% of median. The Upper Arkansas Basin reported 109% of median, the Cucharas and Huerfano basins reported 53% of median, the Apishapa Basin reported 10% of median, and the Purgatoire River Basin reported 15% of the median snowpack.

Table 1 compares the Natural Resources Conservation Service's (NRCS) forecast runoff to the actual measured runoff. The NRCS May 1st forecast predicted streamflow to be 78% of average for the Arkansas River above Pueblo Reservoir, and 45% of average for the Purgatoire River at Trinidad Reservoir. Actual observed snowmelt runoff inflow to Pueblo Reservoir was 50% of the 30-year average used by NRCS, actual observed snowmelt runoff inflow to Trinidad Reservoir was 31% of the 30-year average, and actual observed snowmelt runoff inflow to John Martin Reservoir was 46% of average.

Table 1. May 1, 2020, NRCS/NWS Forecast and Actual Runoff

Arkansas River Basin May 1st Most Probable Snowmelt Runoff Forecast (50% Exceedance)				
Measurement Location	Snowmelt Runoff (x 1,000 Acre-Feet)		Percent of Average	
	May Forecast	Actual	May Forecast	Actual
Arkansas River above Pueblo (April – July)	280	178.6 [1]	78%	50%
Purgatoire River at Trinidad (March – July)	16.5	11.4 [2]	45%	31%
John Martin Dam and Reservoir (April – July)	93 [3]	67.1 [2]	64% [3]	46%

[1] Data Source: Colorado Division Water Resources
[2] Data Source: U.S. Army Corps of Engineers
[3] National Weather Service inflow forecast for John Martin Dam and Reservoir

a. Trinidad Dam and Reservoir

For Compact Year 2020, the reservoir surface elevation started at 6,182.39 ft with storage of 19,880 acre-feet and ended at 6,175.78 ft with storage of 15,520 acre-feet, a net change of -6.61 ft and -4,360 acre-feet, respectively. Storage peaked at 24,360 acre-feet (elevation of 6,188.60 ft) on 31 March 2020. The maximum daily inflow was 212 cubic feet per second (cfs) on 26 July 2020 and the maximum daily release was 188 cfs on 28 July 2020. The total inflow for Trinidad Reservoir was 18,690 acre-feet and total outflow was 20,000 acre-feet. USACE did not operate for flood control at Trinidad Dam and Reservoir in 2020. Figure 1 illustrates daily release, storage and computed inflow to Trinidad reservoir.

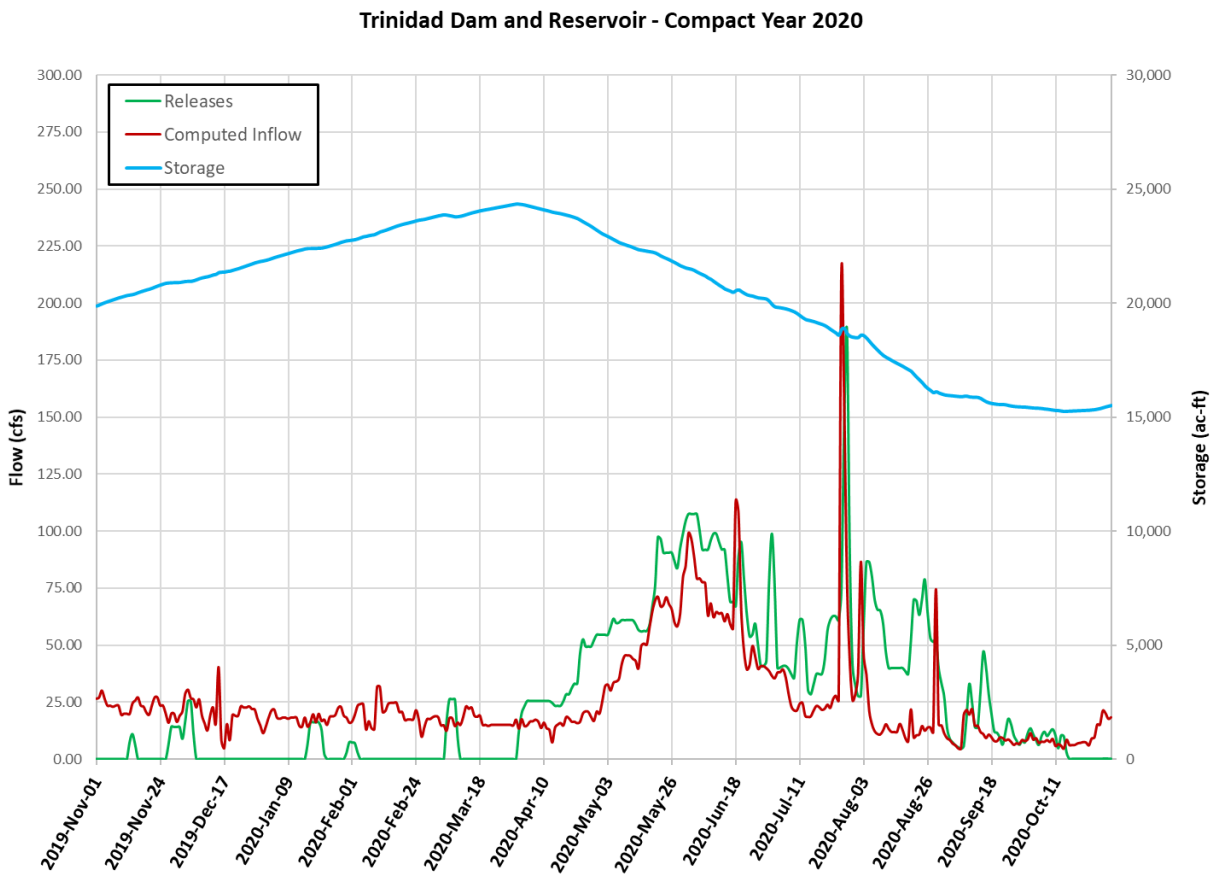

Figure 1: 2019 Trinidad Dam and Reservoir Water Operations

b. John Martin Dam and Reservoir

For Compact Year 2020, the reservoir surface elevation started at 3,817.23 ft with storage of 73,240 acre-feet and ended at 3,806.42 ft with storage of 33,890 acre-feet, a net change of -10.81 ft and -39,350 acre-feet, respectively. Storage peaked at 123,840 acre-feet (elevation of 3,826.69 ft) on 7 April 2020. The maximum daily inflow was 1,058 cfs on 22 June 2020 and the maximum daily release was 1,207 cfs on 9 June 2020. The total computed inflow for John Martin Reservoir was 133,120 acre-feet and total release was 146,760 acre-feet. USACE did not operate for flood control at John Martin Dam and Reservoir in 2020. Figure 2 illustrates daily release, storage and computed inflow to John Martin Reservoir.

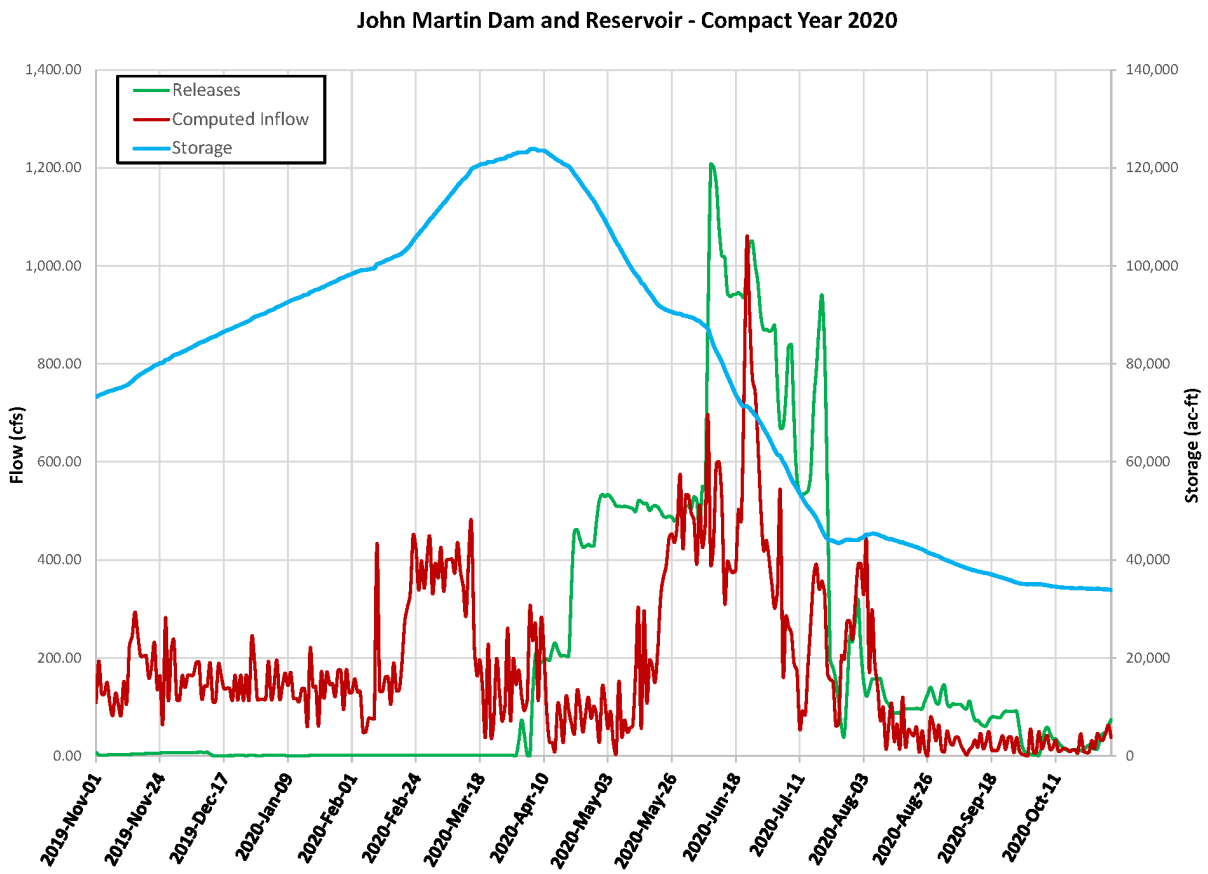

Figure 2: 2019 John Martin Dam and Reservoir Water Operations

c. Water Quality

USACE initiated an expanded water quality monitoring program in Compact Year 2020. Project staff have been collecting monthly water quality data from USACE reservoirs since 2012, which is forwarded to environmental staff in USACE's

Albuquerque District Office for review and entry into the water quality database. At the locations shown below within Trinidad Reservoir and John Martin Reservoir (Figures 3 & 4), staff collect surface measurements of turbidity, pH, and specific conductance, as well as Secchi depth. Data on temperature and dissolved oxygen are collected through vertical profiles through the water column, and zebra and quagga mussel monitoring typically occurs from June through October.

In Compact Year 2020, the Albuquerque District entered into cooperative agreements to install riverine water quality stations upstream and downstream of Trinidad Reservoir and John Martin Reservoir at the locations indicated by red dots (Figures 3 & 4). These sites will collect data on water temperature, dissolved oxygen, turbidity, pH, and specific conductance at 15-minute intervals. Total suspended sediment and sampling of anions and cations will be completed monthly at these riverine stations. Monitoring at most of these riverine stations began in July and August of 2020, and this project is currently funded to provide riverine monitoring through 2025.

The primary goals of this expanded water quality monitoring program are to identify seasonal and other trends in streamflow and reservoir water quality, and to help assess the impacts of Trinidad Reservoir and John Martin Reservoir on the Purgatoire and Arkansas Rivers. The program will also generate and disseminate reviewed real-time and high-frequency water quality data and determine the suitability of using turbidity and streamflow records to calculate high-frequency suspended sediment concentrations and loads upstream and downstream of the reservoirs. The data collected through this program will be reviewed and compiled into a database that will be available through the Albuquerque District Water Management Section.

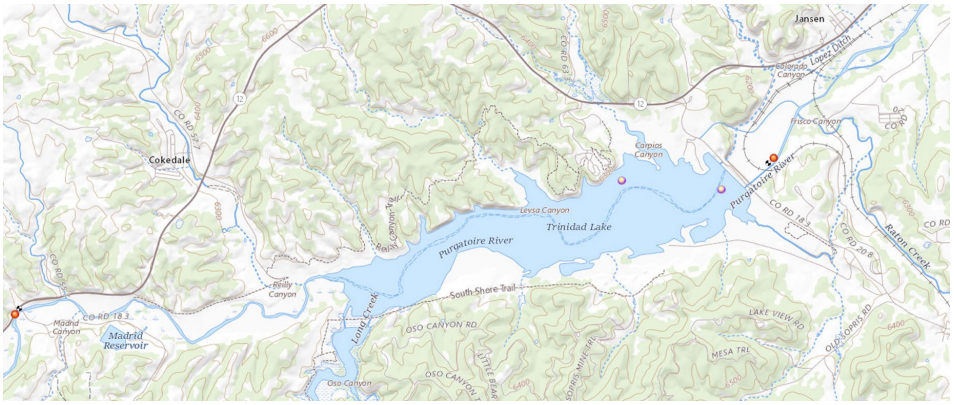

Figure 3: Water Quality monitoring stations at Trinidad Dam and Reservoir

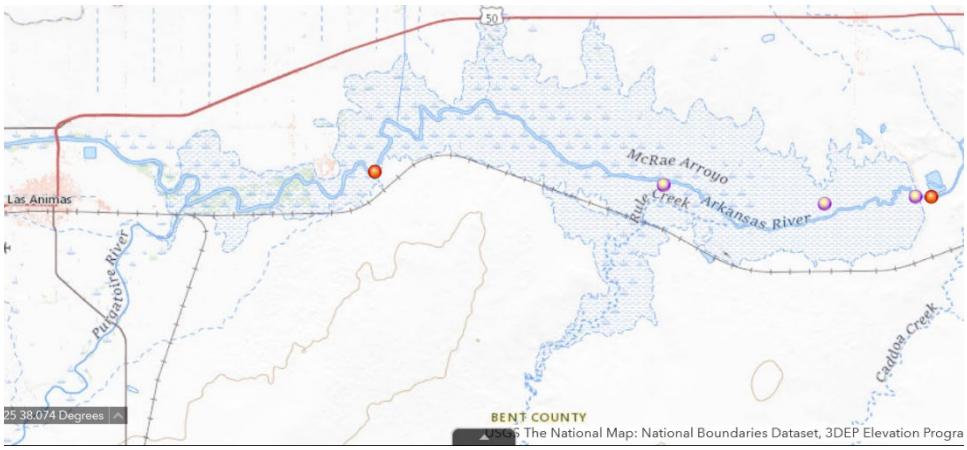

Figure 4: Water Quality monitoring stations at John Martin Dam and Reservoir

3. Operations and Maintenance

a. Trinidad Dam and Reservoir

Routine operation and maintenance projects were conducted at Trinidad Dam and Reservoir during Compact Year 2020.

b. John Martin Dam and Reservoir

During 2020, operations and maintenance projects were completed at John Martin Dam and Reservoir as described below:

a. Inspections and repairs were completed for all six outlet works conduits and service gates. Areas of damaged conduit lining were identified and repaired, and accumulated debris and mineralization were removed from the conduit air vent holes. The Chapman valves associated with the conduit air vents were serviced and repaired.
b. Trunnion pier railings were replaced on the work platforms between each of the tainter gates. These railings allow for safe restraints and with the addition of tie-off points allow for OSHA compliance while performing maintenace of the tainter gate pivot points.
c. Surface concrete repair was completed at the tainter gate seals at the top of the spillway. Patchwork was completed to repair leaking seals under tainter gates 5 and 7.

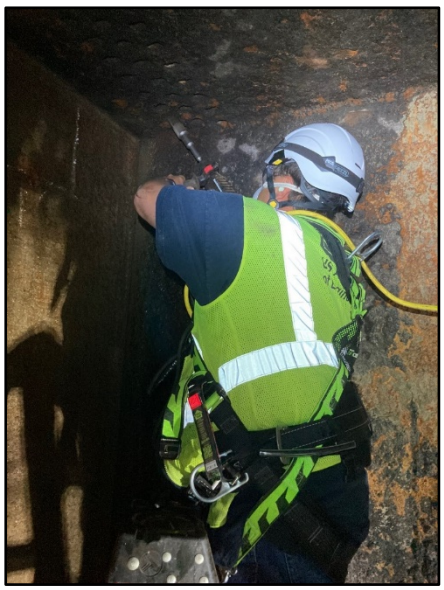

Figure 5: John Martin employee cleaning vents of mineralization and debris

Figure 6: Metal repair patch in conduit liner

4. Civil Works

a. Continuing Authorities Program

The Continuing Authorities Program (CAP) is a group of nine legislative authorities under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and implement certain types of water resources projects without additional project-specific congressional authorization. USACE had two active CAP projects in the Arkansas River Basin in 2020.

Section 205

Section 205 of the 1948 Flood Control Act, as amended, provides authority to USACE to plan and construct small flood damage reduction projects that have not been specifically authorized by Congress. USACE had no active Section 205 projects in the Arkansas River Basin in 2020.

Section 206

Section 206 of Water Resources Development Act (WRDA) 1996 provides authority to USACE for aquatic ecosystem restoration projects in areas unrelated to existing USACE water projects. USACE has two requests received from the City of Colorado Springs pending funding to start feasibility studies, but no active Section 206 projects in the Arkansas River Basin in 2020.

The requested projects occur along Spring Creek near Pikes Peak Avenue and at Shooks Run. The projects would result in restoration of stream and riparian structure and function to include habitat improvement, stabilized stream morphology and sediment management

Section 14

Section 14 of the 1946 Flood Control Act, as amended, provides authority for USACE to plan and construct emergency stream bank protection projects to protect endangered highways, highway bridge approaches, public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities. USACE has two requests for a new start Section 14. However, there are no active Section 14 projects in the Arkansas River Basin in 2020.

The requested project along North Douglas Creek located in the City of Colorado Springs, CO, immediately east of I-25 and west of the confluence with Monument Creek would stabilize 1,100 linear feet of North Douglas Creek that severely eroded during 2013 and 2015 Flood Events and continues to erode with normal flow events. Erosion has damaged the major drainage culvert under I-25 and Sinton Road. If the erosion and bank failure continue, the roadway infrastructure could be damaged and impact the major north-south highway in Colorado.

The requested project with the Fremont Sanitation District, Fremont County, was initiated in the summer of 2019. The objective of the project is to repair and prevent further erosion of the south bank of the Arkansas River to protect the District's wastewater main and the adjacent Canon City Area Recreation and Parks District recreation trail. Currently the project is in a deferred status per request of the Fremont Sanitation District.

Figure 7: Erosion along south bank of Arkansas River in Fremont County.

b. Investigations Program

The USACE Investigations Program includes specifically authorized studies for comprehensive solutions to large complex problems relating to flooding, ecosystem restoration, loss of land and property, floodplain management, and watershed planning and analysis. The Investigations program consists of two phases: the feasibility study

phase, and the pre-construction engineering and design (PED) phase. The feasibility study is used to investigate the Federal interest, engineering feasibility, economic justification and environmental acceptability of a recommended water resources project, and results in a feasibility report. The feasibility report is the document on which congressional authorization for PED and Construction is based. During the pre-construction engineering and design phase, development of the first construction contract bidding package can be completed while waiting for congressional construction authorization. If the project is authorized for construction by Congress, USACE and the project sponsor can move forward with the remaining detailed design and construction. USACE had no active Investigations or Construction projects in the Arkansas River Basin in 2020.

5. Flood Risk Management Program

USACE established the National Flood Risk Management Program (FRMP) in May 2006 to integrate and synchronize USACE activities, both internally and with counterpart activities of the Department of Homeland Security, Federal Emergency Management Agency (FEMA), other Federal agencies, state organizations, and regional and local partners and stakeholders. The USACE Levee Safety Program was authorized in WRDA 2007 and established by the National Levee Safety Act of 2007. The Inspection of Completed Works/Rehabilitation Program (ICW/RP) is the USACE program that provides for the inspection and rehabilitation of Federal and non-Federal flood risk management projects within the ICW/RP (PL8499). For 2020, no active projects in the ICW/RP were removed from the program based on inspection.

The National Levee Database (NLD) is used to track both USACE and Non-USACE levee system inventory and other flood risk management features. The NLD is viewable to the public through the following internet link; https://levees.sec.usace.army.mil/#/. The database contains pertinent information (length, height, crest width, etc.) concerning levee systems as well as flooding risk information for the systems. The database viewer uses both an interactive text search and graphical search functions to locate levee systems of interest.

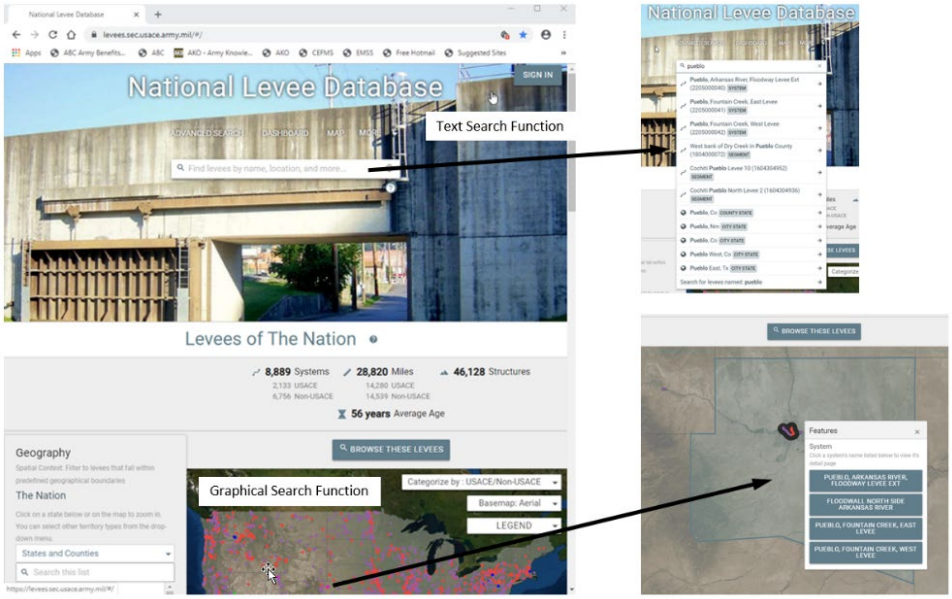

Figure 8: National Levee Database Search Functions

An additional component of FRMP is the Silver Jackets Program, which is part of the National Flood Risk Management Program. The Silver Jackets Program proposes establishing an interagency team in each state with a representative from FEMA, USACE, the State National Flood Insurance Program Coordination Office, and the State Hazard Mitigation Office as standing members and lead facilitators. The lead FRMP Manager for the formation of the Silver Jackets Program in Colorado and the Arkansas River Basin resides in the USACE Omaha District, and the Albuquerque District performs a support role.

The Colorado Silver Jackets team was officially created in 2013. The team consists of four USACE Districts that include the Sacramento, Albuquerque, Kansas City, and Omaha Districts, with the lead Silver Jackets coordinator sitting in the Omaha District. The State of Colorado is represented by the Colorado Water Conservation Board as well as the Colorado Department of Homeland Security. FEMA Region 8 is also part of the State team. There are several ongoing FY20 projects in Colorado including the development of the Colorado After Fire Community Guide, the Mesa County Flood Hazard Assessment, the Grand Junction Emergency Action Planning support and the Riverside Community Flood Risk Report.

6. Regulatory Program

USACE has regulatory authority under Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. The Albuquerque District, Southern Colorado Office (SCO) reviewed a total of 99 activities in the Arkansas River Basin during Compact Year 2020, including 35 activities authorized under general (Regional or Nationwide) permits and 1 activity authorized under a

Standard Individual Permit. General permits are activity-specific permits that are used to authorize projects that result in minimal adverse impacts on the aquatic environment. Standard Individual Permits are required for activities having more than minimal adverse impacts and/or for activities that do not meet the terms and conditions of a general permit.

Persons or agencies who are planning to conduct work in any waterway in the basin are advised to contact SCO at 201 W. 8th Street, Suite 350, Pueblo, Colorado 81003, email at CESPA-RD-CO@usace.army.mil, or telephone 719-744-9119. Information, including all public notices, is also available on the USACE Albuquerque District web home page at: https://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/.

7. Emergency Management Coordination

Public Law 84-99 provides USACE with the authority to assist state and local governments before, during, and after flood events. In the Arkansas River Basin, USACE works with the State of Colorado Division of Homeland Security and Emergency Management and the Colorado Water Conservation Board to prepare for flood fight activities in years with significant snowpack and spring snowmelt runoff.

Assistance can be obtained by contacting the U.S. Army Corps of Engineers, Albuquerque District, Readiness and Contingency Operations Office, 4101 Jefferson Plaza NE, Albuquerque, New Mexico 87109 or telephone 505-342-3686 during our normal business hours between 7 am and 4 pm, weekdays.