Lower Arkansas Valley WATER CONSERVANCY DISTRICT
Serving Bent, Crowley, Otero, Prowers and Pueblo counties

North La Junta River Restoration Project

Project Overview

Lower Arkansas Valley Water Conservancy District (Lower Ark) and the North La Junta Conservancy District acquired the La Junta Streamlined Flooding Mitigation & Flow Management Project with the intention of restoring the Arkansas River, at La Junta, Colorado, back to the historical channel. With time, the channel has developed sedimentation which created islands in the middle of the flow path, along with a manmade dike positioned in the floodplain. The two-phase project began with removal of the islands in January of 2016 and commenced with the removal of the dike in December of 2016. The project was funded by Colorado Water Conservancy Board (CWCB), through Water Supply Reserve Account money, Lower Ark, Otero County, and the City of La Junta.

Background

The Lower Arkansas River passes through a "pinch point" as it traverses the passage between the towns of La Junta, on the south bank, and North La Junta, on the north bank. Flooding in this area has been endemic, since the 1965 flood. In the 1980's, the United States Army Corps of Engineers began building a dike to help mediate the issue of flooding. The dike was never completed and left approximately 1,500 feet of open area prone to flooding. The dike should have been connected to the All-Rite Paving dike to the east. In Figure 1, the red line is the 1980's dike, green is the All-Rite Paving dike, and blue is the area that went unfinished.

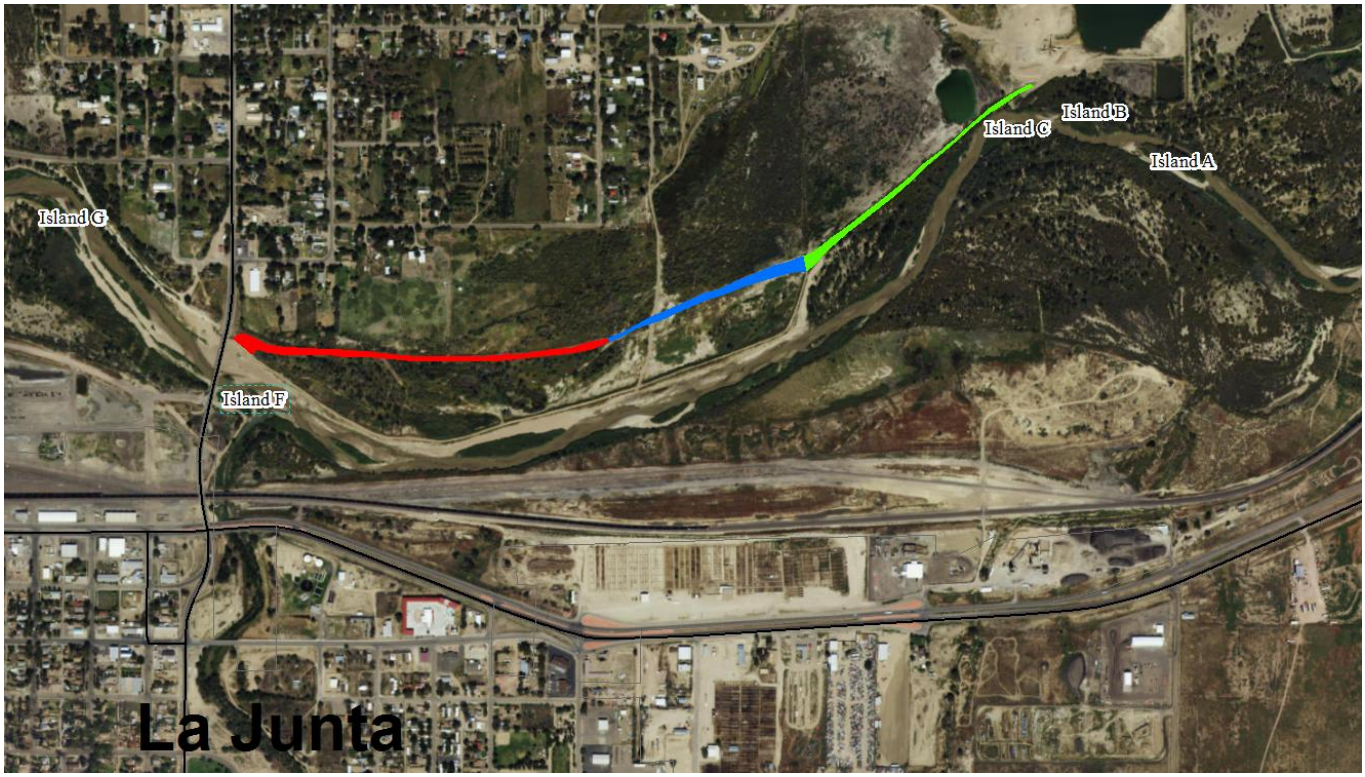

Figure 1: Ariel Snapshot of Army Corps of Engineer's 1980's Dike Showing the Completed Section and Incomplete Section.

The flood of 1999 showed that the current dike was not sufficient and lead to flooding along the north edge of the River. Following this flood event, the North La Junta Conservancy District began constructing a new dike located inside the floodplain using material salvaged from tamarisk and island removal. Figure 2 outlines all the dikes pre-project; the yellow line is the new dike that was built in 2014 by North La Junta Water Conservancy District added to the prior image of Figure 1.

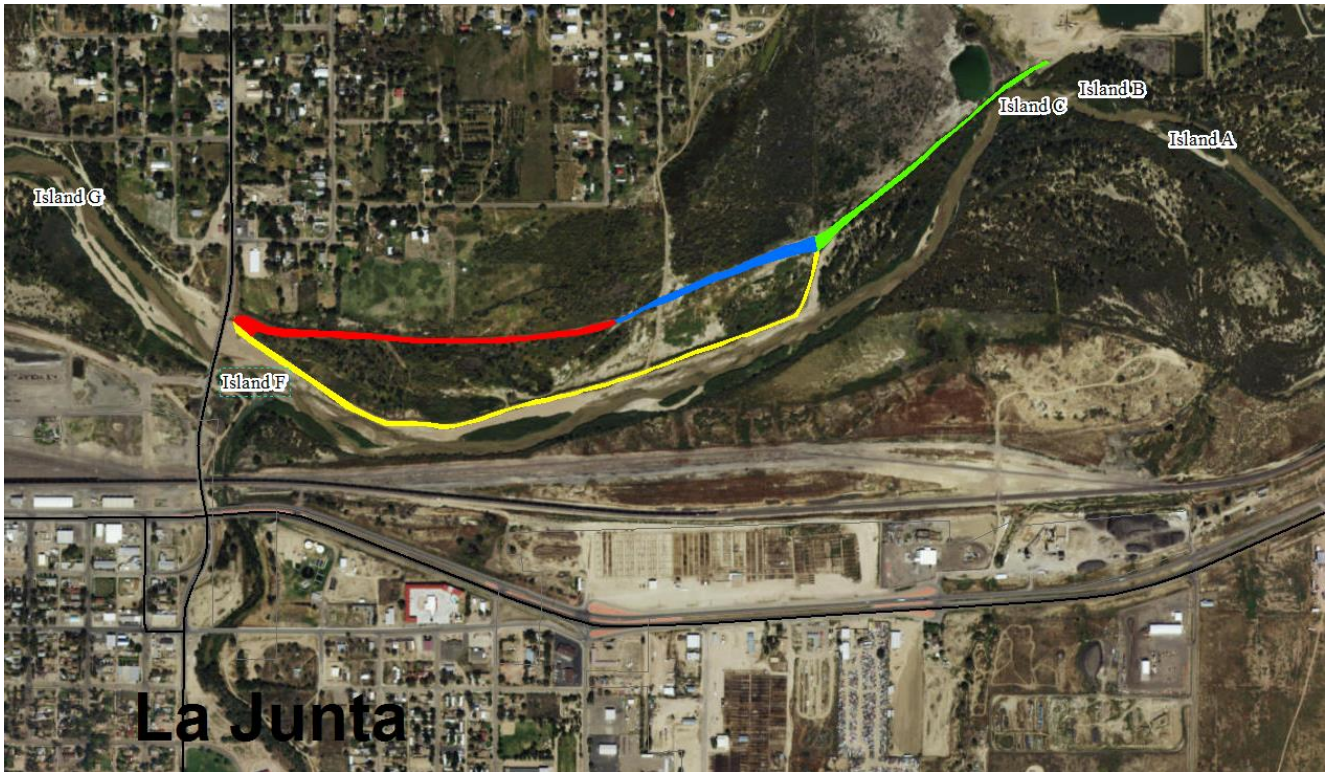

Figure 2: Ariel Snapshot of Army Corps of Engineer's 1980's Dike and New Dike

Along with the issues concerning the dike, sedimentation carried within the stream channel deposited and created islands. On the downstream edge of the dike, three large islands (identified as A, B, an C) were created.

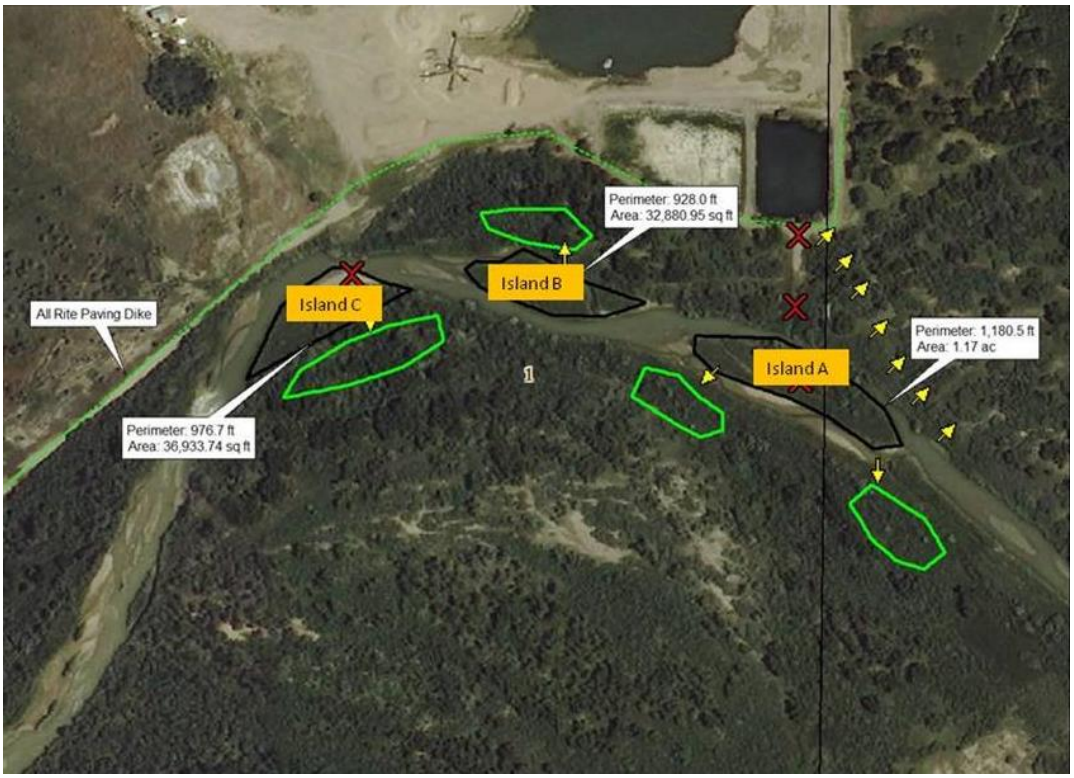

Figure 3: Ariel Snapshot of Islands A, B, and C.

In 2015, the new dike helped protect the town of North La Junta but aggravated the flooding challenges downstream. The islands, joined with the dike, handcuffed the high flood waters forcing the water to move north and eventually leading to washouts on highway 194.

Figure 4: Ariel Snapshot of Flooding Inundation from 2015

To help prevent flooding and allow water to stay in the historic channel, it was determined that the new dike be removed, the 1980's dike be finished and restored, and the islands in the river channel be removed.

Objectives

The objectives of the project were:

- Objective 1 – Coordinate the permitting/construction/reclamation activity with interested agencies.
- Objective 2 – Removal of islands in stream channel to restore channel capacity and reconstruction of extension of existing dike
- Objective 3 – Manage the project from construction to completion, with appropriate retention of contractor payments following final billing, and project signoff for release of retained funds.

Tasks

The three objectives were achieved through the following tasks:

Task 1 – Coordination with Interested Agencies

This project took place in the floodplain therefore, the Corps of Engineers was notified as the controlling agency. Primary communication was done through phone calls and e-mails and one site visit from the Corps of Engineers in February 2016. This site visit required a "no rise permit"

to be obtained, which can be found in Appendix A. Other agencies contacted and notified were the All-Rite Paving, Otero County Commissioners, City of La Junta, North La Junta, and Otero County. Notification was made through e-mail, phone, newspaper, and a site visit. The last set of individuals contacted were the homeowners affected by the construction. These individuals were contacted via mail with an opportunity to voice an opinion at the Otero County Land Development Meeting. No outside opinions were voiced.

Task 2 – Removal of Islands in Stream Channel and Restoration of Historic Dike
Removal of islands, which impede the flow of water in the stream channel causing flooding and the removal of the new dike were performed. This was taken in two phases, one being the island removal and the other the dike concern. All work was performed outside of the irrigation season (March 15th to November 15th) to allow for work in low-flow situations. All work was completed on a "not-to-exceed" policy.

Task 3 – Project Management
Management of this project went through both the Lower Ark and the North La Junta Water Conservancy District. Lower Ark oversaw the permitting, completion, and continual work of the project; while the Conservancy District oversaw the day-to-day operations of the contractor as well as the project inception.

Summary of Construction and Project Management Activities
Before construction began, initial photos were taken by both Janette Meyers and Lex Nichols to document initial work- these photos can be found in Appendix B. Construction began in January of 2016 when Muth Dragline Services began removing the islands from the stream channel. Island A was removed first followed by B, C, F and G. The sedimentation from Island A was moved the south shore and spread out leaving no new hills. Likewise, Island B and C had the sedimentation removed only to the north shore instead of the south shore. Finally, the sedimentation from Island G and F was removed to the south shore and spread out evenly across the land. All sedimentation was moved using the dragline shown in Appendix C, and then smoothed using bulldozers also pictured in appendix C. Wok on the islands was completed in February of 2016.

Work came to a halt when the Army Corps of Engineers required a floodplain permit to work in the flood plain and make restoration changes to historical dike conditions. The permit required a no-rise certification completed by a professional engineer and was obtained through the Otero County Commissioners Land Use Development Agency. To obtain this permit, Lower Ark received additional grant money from CWCB and hired CDM Smith Engineers out of Denver, Colorado to perform the work. CDM Smith used a 100-year flood event of 92,000 cfs, as directed by FEMA, to show that the alterations to the river channel would not raise the water surface by more than 0.5 feet. This work was done using the HEC-RAS modeling. The permit was obtained on October 24, 2016. A copy of the permit can be found in Appendix A.

Following the permit, Muth Dragline Services began removing the new dike and reconnecting the historical Army Corps of Engineers' 1980's dike. This process was done using a pedal

scrapper to rip up the new dike and transport the material to the location of construction. Images of this equipment can be found in Appendix C. Once the material was moved, bulldozers were used to level, smooth, and compact the material to complete the 1980's dike. All the material was moved and compacted in December of 2016. Completion photos of both the island removal and the dike reconstruction can be found in Appendix D.

Lower Ark made site visits throughout the construction process and at the completion of the project to ensure the work. Lower Ark was also involved in the permit acquisition from Otero County. Lower Ark determined that the project was completed on time and within the designated budget. A final schedule of work is outlined in Appendix E.

Appendix A: Floodplain Permit

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PERMIT
ISSUED PURSUANT TO
MAJOR IMPACT REVIEW PROCESS
U-537-16

Pursuant to the Otero County Land Use Code heretofore adopted by the Board of County Commissioners, the County has received an application from ***North La Junta Conservancy District*** for a permit to conduct the following matter:

A Special Use Permit to allow the North La Junta Conservancy District with the Arkansas River Flood Mitigation Project in the removal of an earthen dike and construction of a new section of dike to connect the old original dike with the All Rite Paving dike. This is in order to reconnect the river to a larger portion of its historic floodplain.

After hearing, and consideration of the recommendation of the Otero County Planning Commission, if any, the Board of County Commissioners hereby approves the application as follows:

1. This Permit authorizes the Applicant North La Junta Conservancy District a Special Use Permit to allow the North La Junta Conservancy District with the Arkansas River Flood Mitigation Project in the removal of an earthen dike and construction of a new section of dike to connect the old original dike with the All Rite Paving dike. This is in order to reconnect the river to a larger portion of its historic floodplain.

2. This Permit will be in force indefinitely, so long as the terms and conditions of this Permit are fully complied with.

3. The use authorized by this Permit shall be in conformity with all applicable federal and state statutes and regulations as well as all applicable local regulations, land use controls including, but not limited to, applicable comprehensive or master plans, subdivision regulations, zoning and building codes.

4. Additional Permit Conditions:

   (a) In accordance with Section 2-103 of the Otero County Land Use Code, this Permit shall be binding upon and run with the land which it applies.
   (b) Any and all State and Federal Permit requirements are to be complied with in their entirety.
   (c) Any and all Health Department requirements are to be complied with in their entirety.

Resolution – Special Use Permit
1

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DATED this **24th day of October, 2016**

ATTEST:

Clerk to the Board

(COUNTY SEAL)

BOARD OF COUNTY COMMISSIONERS
OF OTERO COUNTY, COLORADO

By
Chairman

Commissioner

Commissioner

Resolution – Special Use Permit
2

Appendix B: Initial Project Photos

Island A

Island B

Island C

Island F

Island G

Appendix C: Progress Photos

Dragline Removing Island A

Bulldozer Moving Sediment from Island B

Pedal Scrapper Picking Up the 2014 "New" Dike

Pedal Scrapper Moving Material to the 1980's Dike

Appendix D: Completion Photos

Dike Completion

Island A

Island B

Island C

Island F

Island G

Appendix E: Progress Schedule

Item	Start Date	End Date
Project Began	January 2016	
Island Removal	January 2016	February 2016
Irrigation Season	March 15, 2016	November 15, 2016
Floodplain Permit	June 2016	October 11, 2016
Dike Removal	October 2016	December 2016
Project Completed	December 2016	