FINAL REPORT

Prepared for

The Colorado Water Conservation Board & South Platte Basin Roundtable

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Pedersen Bend Farm Recharge Project

Submitted By

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DUCKS UNLIMITED

INTRODUCTION

In 2016, Ducks Unlimited (DU) acquired a 100-acre farm near Ovid, CO to create a multi-purpose water project that benefits migratory waterfowl and shorebird populations, sustains irrigated agriculture, enhances public recreational opportunities along the lower South Platte River, and contributes toward the 2050 storage goal of 400,000 acre-feet, set forth in Colorado's Water Plan. With a strong partnership between DU and the Julesburg Irrigation District (JID), and generous support from the Colorado Water Conservation Board, Wrangler (VF Corporation), and Colorado Parks and Wildlife, construction of the recharge project was completed in June of 2019.

WATER AGREEMENT

Prior to project construction, DU entered into a long-term water management agreement with JID to supply the property with recharge water. The original plan called for four small recharge ponds to be developed on the property, but discussions with JID ultimately led to the construction of two large ponds, which better fit the needs of the irrigation district. The two ponds were added to JID's decree and they will receive delivery of Pedersen Ditch water through a lift station located adjacent to ditch. CWCB funding allowed for the existing pumps and pipelines to be integrated with new water infrastructure, enabling the recharge cells to be utilized independently or in concert. The diversity of options will enable JID to better manage South Platte River water resources and improve agricultural viability into the future by firming up augmentation supplies for junior well depletions.

TASK SUMMARY

The deliverable was broken down into the following five tasks:

Task 1 – Land Acquisition: completed in October 2016
Task 2 – Project Administration: scheduling, invoicing, and progress reports
Task 3 – Land Surveying and Engineering Plan Set Development: site-wide cadastral survey and creation of final engineering plan sets for construction
Task 4 – Construction: solicitation of bids, site showings, contracting, construction management**,** materials and labor
Task 5 – Final Report to the CWCB: upon project completion

CONSTRUCTION SUMMARY

Lower South Platte Water Conservancy District conducted on-site soil coring to determine the suitability of the alluvial sediments for groundwater recharge and general project development. The

soil cores and existing drill logs from the nearby production and monitoring wells confirmed the presence of a highly permeable and continuous sand and gravel layer ranging from 20-28 feet thick. With a depth to water greater than 15 feet throughout the site, aquifer conditions are considered highly suitable for groundwater recharge operations.

The DU engineering team completed a full cadastral survey of the property and utilized the data to complete an AutoCAD design and engineering plan set for construction (Figure1). DU solicited four competitive bids from independent contractors and entered into a contract with Ensminger Construction. Construction began in January of 2019 and was completed in June of 2019.

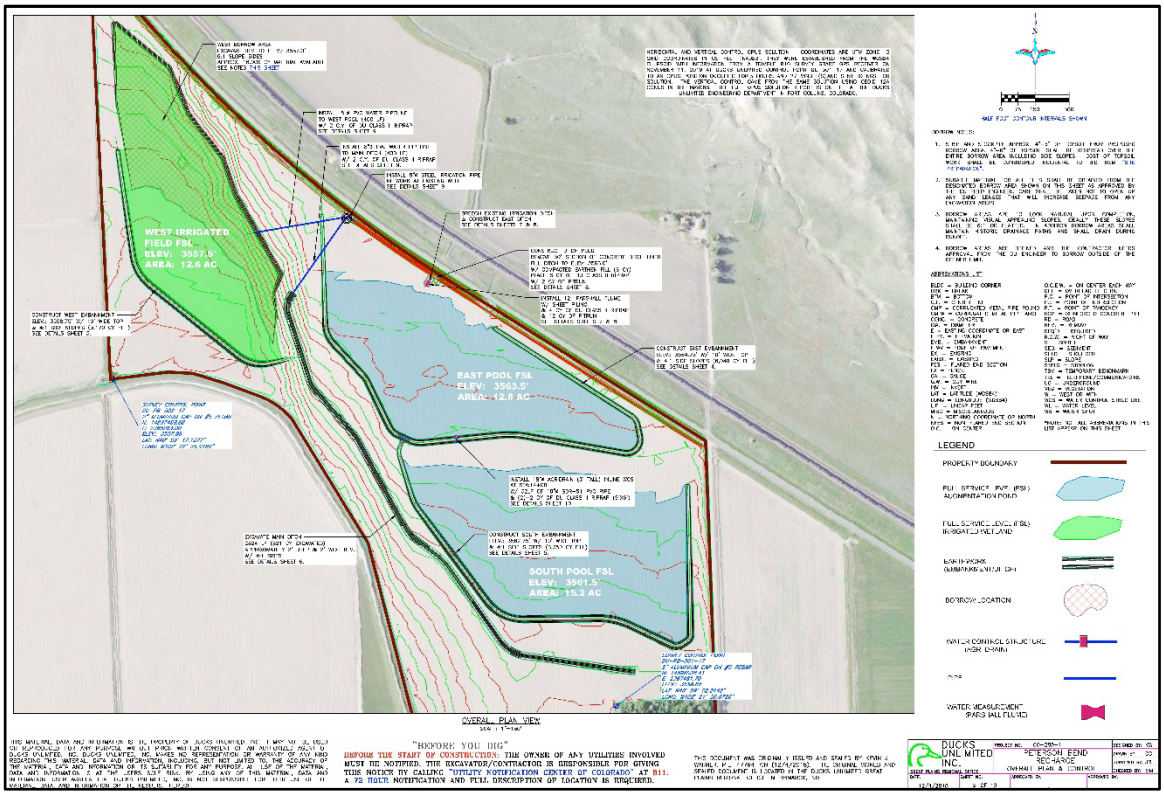

FIGURE 1 – Construction plan set (sheet two – project overview)

RECHARGE OPERATIONS

Water is delivered to the north side (upgradient end) of the property through a pump and pipeline system owned and operated by JID. To accommodate both irrigation and recharge water to the Pedersen Bend Farm and nearby adjoining farms, DU designed a three-way valve tree that allows for water to be split between the properties during the different water use seasons (Picture 1). During the recharge season, water delivered to Pedersen Bend Farm passes through a flow meter on the valve tree and is immediately discharged into the East Recharge Pond. To accommodate water

conveyance into the South Pond, we designed a flow through system that utilizes an in-line water control structure (Agri-Drain) installed in the East Pond embankment (Picture 2).

Picture 1- Three-way valve tree and flowmeter

Picture 2- Agri-Drain installed in East Pond embankment

The Agri-Drain allows for pond elevations to be managed in 4-6 inch increments, ideal for foraging waterfowl and shorebirds that rely on shallow water habitat. At full-service level (FSL) the east pond is 12.5 surface acres and the South Pond is 14.8 surface acres (Table 1).

Table 1 – Recharge pond statistics

East Pond					
Elev (ft)	Pond Elev (ft)	Area (ft^2)	Area (ac)	Storage (ac-ft)	Total Volume (ac-ft)
3561.5	3561.5	16	0.00	0.00	0.00
3562.0	3562	10459	0.24	0.04	0.04
3562.5	3562.5	154103	3.54	0.78	0.82
3563.0	3563	367039	8.43	2.90	3.73
3563.5	3563.5	543811	12.48	5.19	8.92
South Pond					
Elev (ft)	Pond Elev (ft)	Area (ft^2)	Area (ac)	Storage (ac-ft)	Total Volume (ac-ft)
3559.1	3559.1	100	0.00	0.00	0.00
3559.5	3559.5	88887	2.04	0.28	0.28
3560.0	3560	263370	6.05	1.93	2.21
3560.5	3560.5	399126	9.16	3.78	5.99
3561.0	3561	503373	11.56	5.17	11.16
3561.5	3561.5	643325	14.77	6.56	17.72

The ponds have an average Stream Deletion Factor of approximately 560 days, and we anticipate receiving recharge water for the first time in the Fall of 2019. As part of the Basin Roundtable approval, DU will report on the actual recharge statistic once the recharge ponds are operational.

LAND RECLAMATION AND FUTURE USE

After construction was completed, DU developed a plan with the Natural Resource Conservation Service (NRCS) to reestablish native grasses on the property. The timing of construction completion (June 2019) was too late in the year to allow for a native seed mix planting so we opted to plant a temporary cover crop until grasses could be planted the following spring. We have implemented a weed control program until native grasses become established and we will be mowing or maintaining vegetation in the recharge ponds as per the water management agreement with JID.

PROJECT BENEFITS

This project addresses four categories of measurable objectives under Section 10 (Critical Action Plan) of the Colorado Water Plan (CWP). The following is a description of the specific critical actions this project will contribute toward under Section 10.3 of the CWP.

10.3A. Supply Demand Gap

Through collaborative management of water resources in Water District 64, South Platte River streamflow will be retimed from periods of excess (spring and fall) to times of deficit (summer irrigation season). This conservation of water that would otherwise leave Colorado unused assists in narrowing the agricultural supply gap and helps Colorado meet its obligations under the South Platte River Compact with Nebraska.

10.3D. Agriculture

Without a reliable source of augmentation, many junior agricultural wells are at risk of curtailment during dry years. The additional augmentation supplies generated by this project will help to maintain Colorado's agricultural viability, support our rural economies, and provide food security by offsetting agricultural well depletions for Julesburg Irrigation District and Sedgwick County Well Users.

Although the property will be taken out of row crop production after the 2018 growing season to allow for project construction, the upland areas will be planted back into grassland mix suitable for grazing and haying. Once the grasses become established, the property will be opened for use by local livestock producers.

10.3E. Storage

Considering the inefficient environmental permitting process and high costs for building for new reservoirs, aquifer recharge projects have become the premier IPP for water needs in the South Platte Basin. This multi-purpose aquifer recharge project provides an innovative water storage alternative that will be operational in under two years and provide measurable annual supplies. Preliminary estimates indicate this project could contribute as much as 1,000 acre-feet per year and would provide a positive step towards achieving the 400,000-acre-foot goal of additional yield from IPP's by 2050.

10.3F. Watershed Health, Environment, and Recreation

A primary benefit of this project will be the increase in migratory bird hunting and viewing opportunities along the South Platte River (SPR) with the restoration and creation of shallow water habitat. The ponds will aide in maintaining the habitat base for the significant population of nonbreeding waterfowl that utilize the lower South Platte River in fall, winter and, especially, spring. The target species for this project include mallards and northern pintails, although all dabbling ducks will benefit. The intent of the project is to increase the availability and quality of shallow-water habitat to spring and fall migrants, such that body condition is maintained, and pre-breeding physiological demands are met. These habitat types are in decline along Colorado's South Platte River.

In addition to supporting the local and state economy with new recreational bird viewing and waterfowl hunting opportunities, this project's location within Water District 64 will benefit the recovery of four threatened or endangered species in the Central Platte of Nebraska. Under the Three States Agreement, the South Platte Water Related Activities Program utilizes augmentation credits from JID's plan to help meet Colorado's water obligations.