



COLORADO

Colorado Water Conservation Board

Department of Natural Resources

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TO: Colorado Water Conservation Board Members

FROM: Erik Skeie, Interstate, Federal & Water Information Section

DATE: March 22-23, 2017 Board Meeting

AGENDA ITEM: 26. HB15-1178 Emergency Dewatering Grant Program Update

Introduction

There have been increased occurrences of high groundwater issues since about 2008 in several areas in the lower South Platte Basin. HB12-1278 authorized a study of the South Platte River alluvial aquifer focusing on these groundwater issues. The South Platte Basin Roundtable formed a Groundwater Technical Committee (Technical Committee) in 2014 to review recommendations from the HB12-1278 report, the first of which concerns mitigation of localized high groundwater conditions.

HB15-1178 (Saine & Humphrey—Marble) established an emergency dewatering grant program, to be administered by CWCB, for the purpose of lowering the water table in the Gilcrest and Sterling areas. \$165,000 was transferred from the General Fund to the dewatering program in FY15/16, and \$290,000 was transferred in FY16/17. An additional \$125,000 was transferred to the dewatering program through Section 12 of SB15-253 (CWCB Projects Bill), for a total of \$580,000.

This agenda item is an update on the progress of the HB 15-1178 Emergency Dewatering Grant Program.

Projects at a Glance

Project	Board Approval	Funding Awarded	Status
Gilcrest School Well Dewatering System	July 2015	\$90,000	Withdrawn
Dewatering Improvements Study for the Town of Gilcrest	January 2016	\$139,800	Complete
Dewatering Pilot Project Near Gilcrest	May 2016	\$140,329.50	Awaiting Final Report
Pawnee Ridge Dewatering System	September 2016	\$128,407	In Progress
Total Encumbered:		\$408,536.50	
Total Remaining:		\$171,463.50	

Potential Future Projects

Interstate Compact Compliance • Watershed Protection • Flood Planning & Mitigation • Stream & Lake Protection
Water Project Loans & Grants • Water Modeling • Conservation & Drought Planning • Water Supply Planning



Currently, there are two potential projects that may come for the remaining HB15-1178 funds. Costs for these projects are estimates and subject to change.

Gilcrest Wastewater Treatment Plant Dewatering Well - \$60,000 (potentially to be matched by a DOLA grant)

Dewatering Pilot Project Near Gilcrest Year 2 - \$110,000

Staff Recommendation

This item is informational only, and there is no action required by the Board.

Attachments:

Project Summary Sheets:

1. Gilcrest School Well Dewatering System
2. Dewatering Improvements Study for the Town of Gilcrest
3. Dewatering Pilot Project Near Gilcrest
4. Pawnee Ridge Dewatering System

Gilcrest School Well Dewatering System



INTRODUCTION

The Gilcrest School Well Dewatering System was the first application to go before the CWCB Board for the HB15-1178 Emergency Dewatering Grant Program. The project was conditionally approved for \$90,000.

BACKGROUND

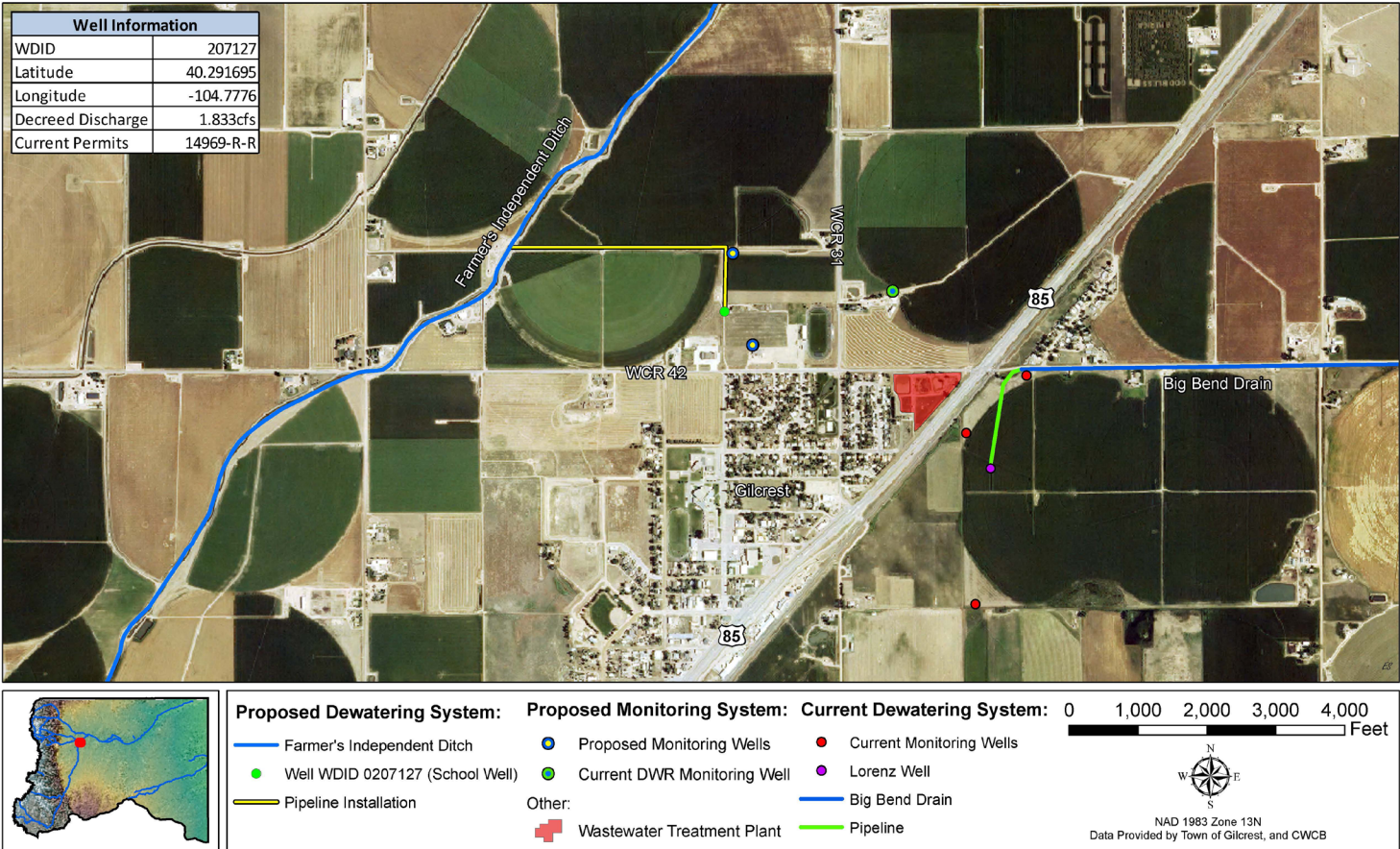
Through previous efforts of the South Platte Basin Round-table Groundwater Technical Committee (Committee), dewatering had begun near the Town of Gilcrest utilizing an irrigation well on the east side of Highway 85. Though this well showed an immediate response in lowering the water table around it, it was determined by the Committee that another well should be utilized by the Town of Gilcrest in order to provide more relief from high groundwater. The School Well (WDID 0207127) was selected as the most feasible option at the time. The application was submitted to the Board for approval in July of 2015, immediately after the approval of the

HB15-1178 Guidelines. The application was for \$90,000 and proposed pumping the water from the School Well west to the Farmer’s Independent Ditch (FIDCo). At the time of the application, discussions had taken place between the Town of Gilcrest and FIDCo, with preliminary indications that FIDCo would allow the use of their ditch. The CWCB Board approved the project contingent on getting all permissions solidified.

RESULT

After a several-month delay, FIDCo shareholders voted to deny permission for Gilcrest to convey the water to the South Platte River through the ditch. Due to this decision, the project did not move forward and was withdrawn.

Figure 1: School Well Dewatering Project Proposal



Water from the School Well was to be piped west to the Farmer’s Independent Ditch, where it would be conveyed north to the South Platte River.

Dewatering Improvements Study for the Town of Gilcrest



INTRODUCTION

The Dewatering Improvements Study for the Town of Gilcrest was approved for \$139,800 at the January 2016 Board Meeting.

BACKGROUND

After the initial \$90,000 School Well Project (originally conditionally approved in July 2015) was withdrawn, it was determined by the South Platte Basin Roundtable Groundwater Technical Committee that a new means to convey water to the South Platte was necessary in order to provide Gilcrest with a reliable dewatering solution. This Study, conducted by JVA and Bishop-Brogden Associates, Inc., had three main objectives:

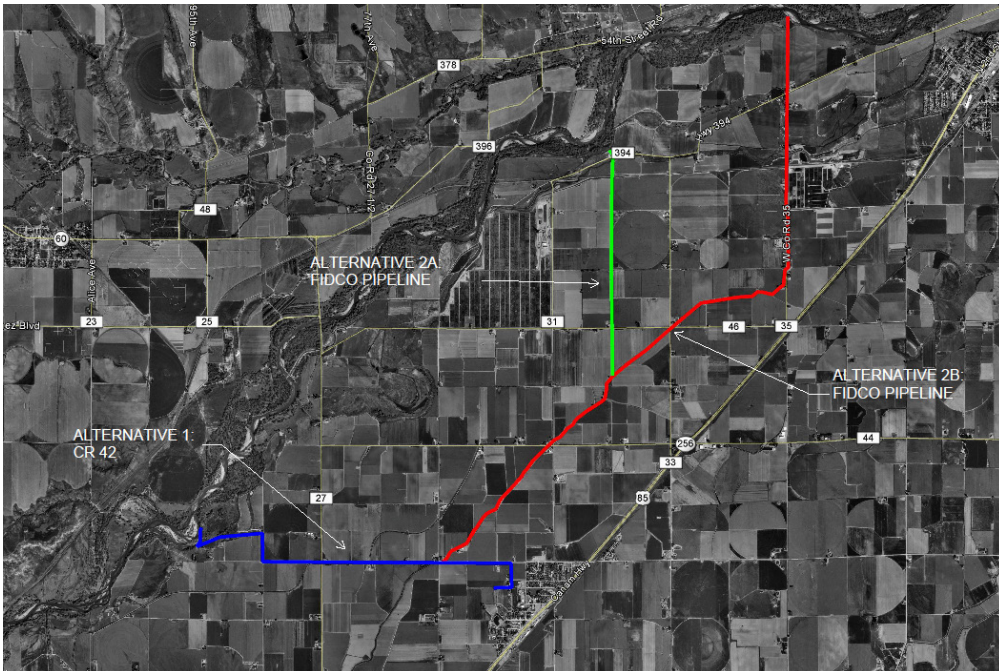


Figure 1: Three alternatives were identified as permanent dewatering conveyances for the Town of Gilcrest. The first alternative uses the existing alignment of the wastewater discharge pipeline to the west. The other two alternatives turn north at the Farmer's Independent Ditch.

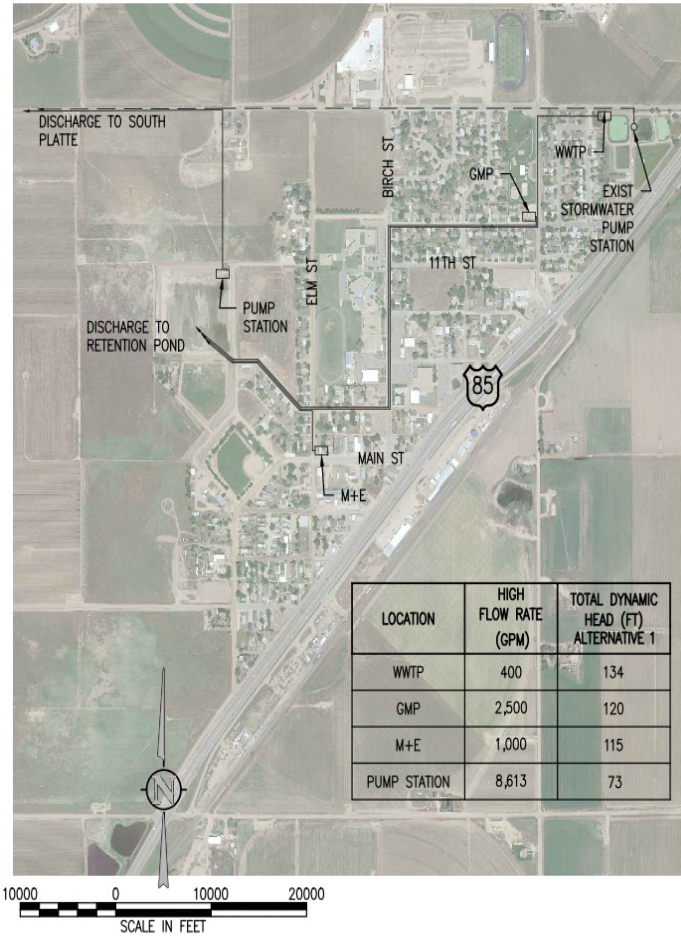


Figure 2: Proposed dewatering wells for the Town of Gilcrest

- 1) Review previous studies, quantify current groundwater levels beneath the town, document existing and proposed areas of groundwater recharge near the town, and establish the initial target dewatering rates and groundwater levels.
- 2) Develop three conceptual dewatering and conveyance systems, and evaluate these systems against economic and non-economic criteria.
- 3) Recommend a preferred dewatering conveyance alternative.

RESULTS

One interim option and three long-term options were identified for dewatering in the Town of Gilcrest. The interim solution consists of constructing a dewatering well near the wastewater treatment plant on the northeast end of town. This well would tie into the existing effluent line that runs west out to the South Platte River. It is estimated that one well near the plant pumping at a rate of 336 gpm could potentially lower the water table 1-2 ft near the treatment plant.

The three permanent alternatives utilize two existing wells in Gilcrest and the above-mentioned new well to be installed near the waste water treatment plant (Figure 2, Table 1). These three wells would all pump into the storm water retention pond on the west edge of Gilcrest, then conveyed to the South Platte River via one of the three pipeline alignments (Figure 1).

Alternative 1: Pressurized Pipeline that runs west to the South Platte River

Alternative 2: Pressurized/Gravity Flow Combination west to the South Platte River

Alternative 3: Multi-Use Multi Benefit Pipeline north to the South Platte River.

It was determined that the most economically feasible alternatives were 1 and 3, with Alternative 3 allowing for more partnership opportunities along the pipeline (Table 2). Though Alternative 3 has significantly larger costs it does allow for more partnerships making it cost competitive to Alternative 1.

The final study can be found [here](#).

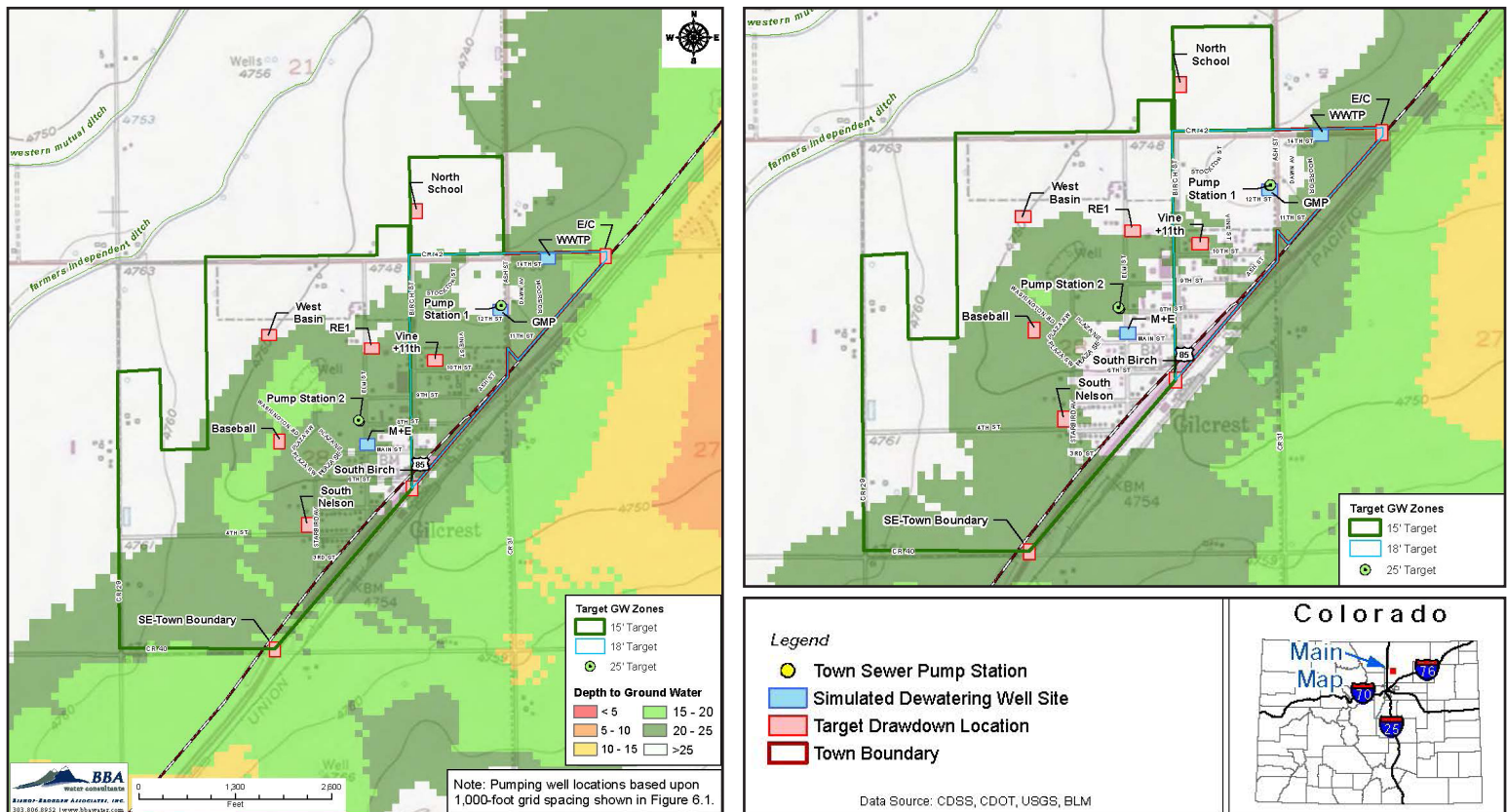
Table 1: Dewatering infrastructure specifications

Dewatering Infrastructure	Flow Rate (gpm)	Total Dynamic Head (ft)
WWTP	450	191
GMP	2,500	148
M+E	1,400	124
Stormwater Retention Pump Station	4,350	168.28

Table 2: Summary of costs for the dewatering alternatives

Costs	Alternative 1	Alternative 3
Project Cost	\$7,161,000	\$11,233,000
20 Year O&M (2016PW)	\$4,841,700	\$7,051,000
Total Cost	\$12,002,700	\$18,284,000

Figure 3: Modeled groundwater levels in Gilcrest after 1 year (left) and 5 years (right) of pumping under the specifications in Table 1.





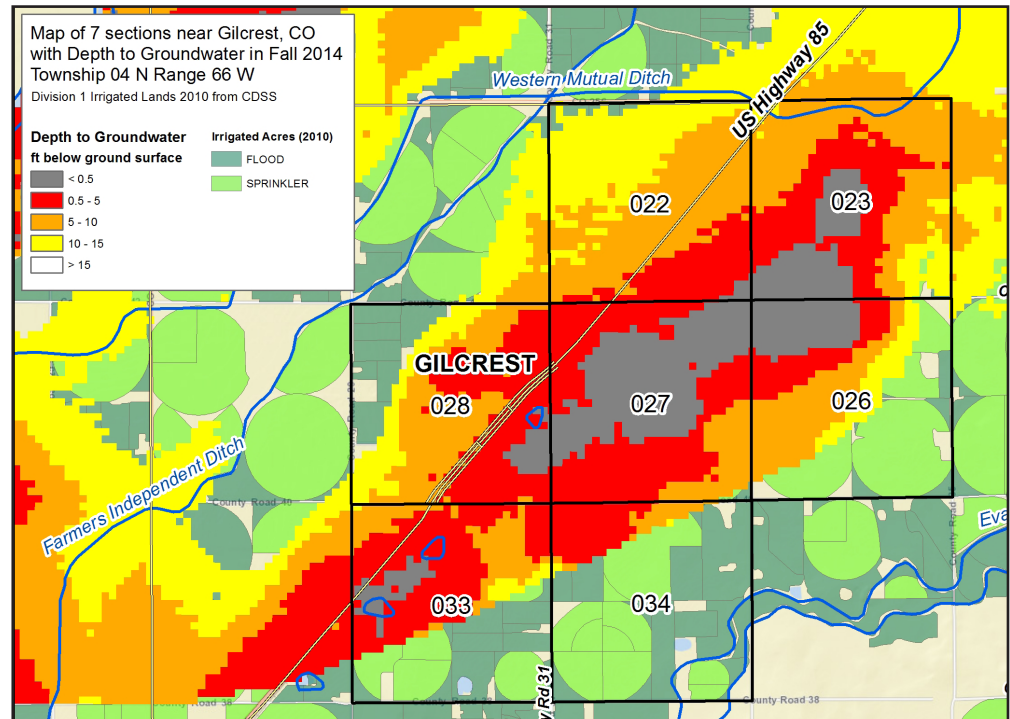
Gilcrest Area Pilot Project

INTRODUCTION

The Gilcrest Area Pilot Project has recently completed its first irrigation season. There were six participants for this first year in the seven section area who were incentivized to pump more groundwater and divert less surface water in an effort to lower the groundwater table.

BACKGROUND

The South Platte Basin Roundtable Groundwater Technical Committee, in collaboration with Central Colorado Water Conservancy District (Central), West Greeley Conservation District (WGCD), the Town of Gilcrest, Colorado State University (CSU), the Governor's Office, the State Engineer's



The 7 Section Area for the Pilot Project was determined based on the depth to groundwater in the area; these seven sections envelope the areas with the highest groundwater.



Office, and the Colorado Water Conservation Board (CWCB), developed the Pilot Project with the intent of lowering the groundwater table via alternative management strategies, while operating within the existing legal boundaries of prior appropriation. The pilot includes elements of the HB12-1278 study and HB15-1013, and was funded for \$140,329.50 for the first year through the HB15-1178 Emergency Dewatering Program.

YEAR ONE

Two options were provided for participation in the Pilot Project for the first year. The first option A incentivized farmers to pump beyond their historical average up to their 2016 quota from Central by paying them \$60/AF pumped above their 2013-2015 average. The second option B allowed participants to pump their full contractual amount with Central by providing additional augmentation water specifically for the project. There were six participants in total (note that some participants had multiple contracts with Central), and there was just under 670 AF (see table on back) of water that participants were incentivized to pump. CSU worked with some of the participants to install monitoring wells on their properties, and one of the participants was also willing to install soil moisture probes in order to better monitor their field.

By the end of the irrigation season, participants had pumped an additional 534 AF beyond the 2013-2015 average. Colorado State University, in conjunction with Principia Mathematica, is currently analyzing the data from this first year to help determine what impact this additional pumping may



have had on the water table
within the seven section area.

YEAR TWO (Proposed)

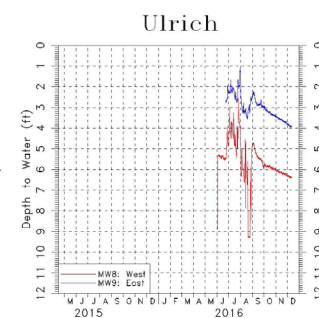
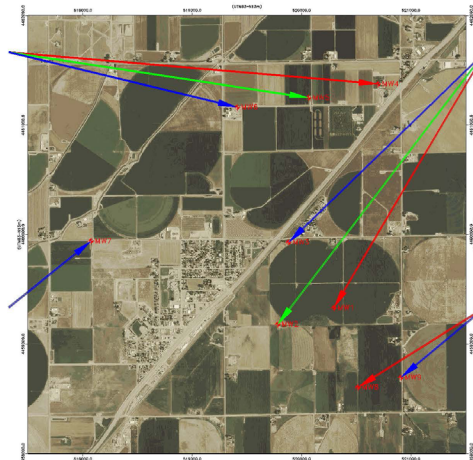
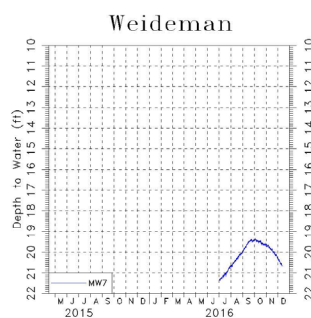
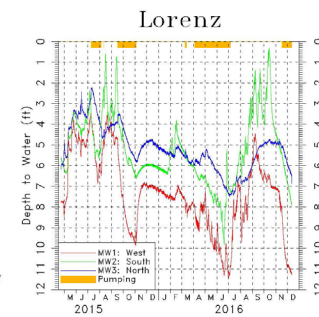
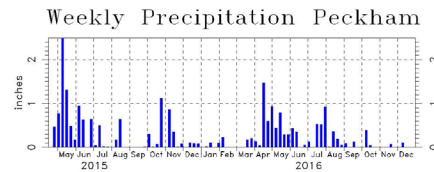
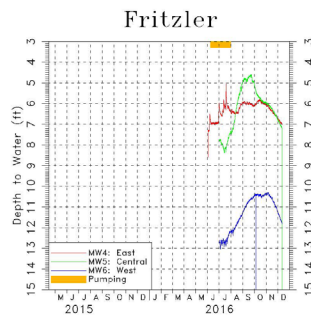
Project proponents realize that one year of data does not allow for proper recommendations and conclusions, and so a second year of the Pilot Project is currently being developed. There is significantly more emphasis on ensuring that participants do not lose value for their surface rights. Data collection is also a major focus for year two, including soil moisture probes, soil profile mapping, and better surface diversion data collection.

Pilot Project Option	Subdistrict	Contract No.	Field Efficiency	2016 Allotment (Metered Pumping)	2013-15 Historical Pumping	2016 Pilot Increased Pumping	2016 Pilot Increased CU	2016 Total Pumping by Contract
				AF	AF	AF	AF	AF
B	GMS	423	0.6	157.94	110.95	204.92	122.952	315.87
A	GMS	388	0.78	54.20	3.32	50.56	39.4368	53.88
A	GMS	1150	0.75	64.46	13.76	50.71	38.0325	64.47
B	WAS	863	0.6	79.67	15.12	93.52	56.11	108.64
B	GMS	415	0.6	78.97	8.05	110.40	66.24	118.45
B	GMS	748	0.6	41.87	36.68	47.05	28.23	83.73
B	WAS	94	0.6	92.11	0.00	30	18	30.00
B	GMS	968	0.73	56.83	58.08	0	0	56.83
B	GMS	421	0.6	83.26	85.32	10	6	93.26
B	WAS	921	0.75	50.70	8.39	72.15	54.1125	80.54
Totals				759.99	339.67	669.31	429.11	1005.67

Year 1 of the Pilot Project set out to incentivize farmers to pump an additional 670 AF beyond their 2013-2015 average; any increased consumptive use from groundwater was replaced through a lease with Aurora Water.



Gilcrest Water Level Data Colorado State University Measurements



Pawnee Ridge Dewatering System


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INTRODUCTION

The Pawnee Ridge Dewatering System was approved by the CWCB Board for \$128,407 at the September 2016 Board Meeting.

BACKGROUND

Damaging high groundwater conditions have existed in the Pawnee Ridge subdivision since April of 2010, primarily along Dakota Road on the northwest side of the subdivision. Pawnee Ridge residents Gene Thim and Sandy and Bonnie St. John permitted and installed dewatering wells on their property in early 2011 to lower the water table in their area. These wells were initially connected to a borrowed aboveground 4-in aluminum pipeline

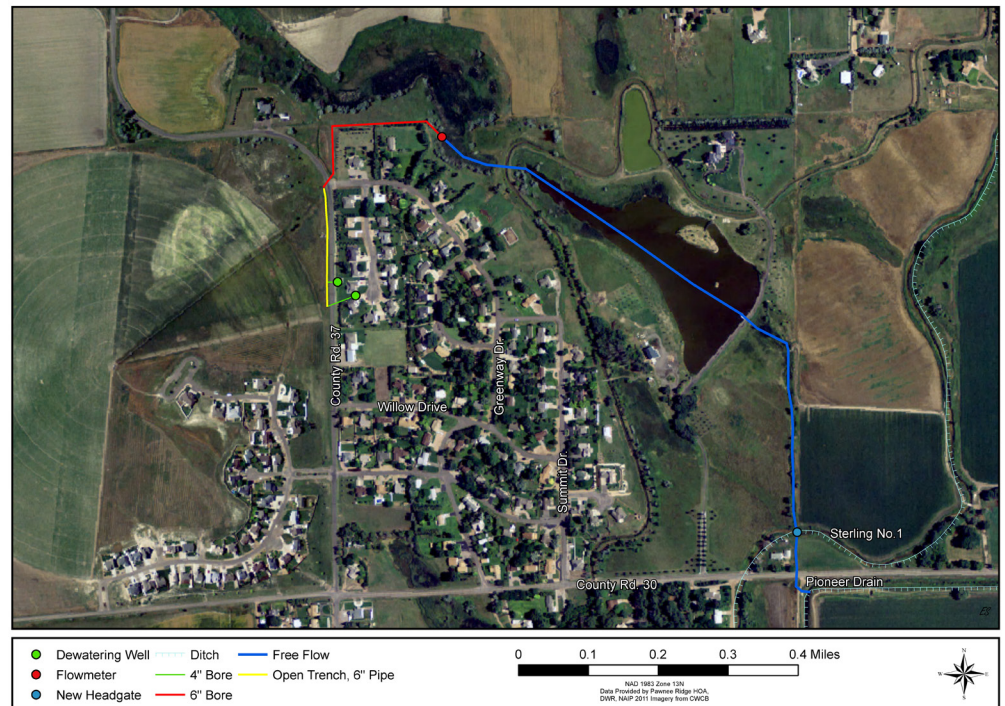


Figure 1: Pawnee Ridge permanent dewatering system



The St. John dewatering well as it is being tied into the permanent pipeline.

that delivered the pumped water north. Pumping continued until late fall of 2011, when it was discontinued due to a couple of factors, including the owner of the pipeline requesting the pipe back, and one property owner no longer wanting an aboveground pipeline running through their property.

DESCRIPTION

The project is for installation of a permanent dewatering system for the Pawnee Ridge subdivision. The Pawnee Ridge HOA worked with Division 1 staff, Logan County and affected private property owners to ensure the water makes it back to the South Platte River in such a way that it can be measured and not cause any injury.

The dewatering system utilizes existing dewatering wells permitted in 2010 and 1670 feet of 6-in HDPE pipeline to convey the water north to the Gentz property. This new system utilizes pre-existing infrastructure and a rehabilitated headgate from where it daylights on Alan Gentz's property to the Pioneer Drain, which conveys the water to the South Platte River.

CURRENT PROGRESS

To date, the Pawnee Ridge Homeowner's Association has finished installation of the dewatering pipeline, and has begun

rehabilitating the headgate to the Sterling No. 1 Ditch. Pumping began immediately after installation of the pipeline was complete. Residents have stated that sump pumps in homes in the surrounding area have begun to pump less water.

REMAINING WORK

All that remains for the project to be complete is final installation of the rehabilitated headgate at the Sterling No. 1, and installation of the telemetry system for data collection. This work is on track to be completed within the next few months, weather permitting.



Open trench installation of 6" pipeline running north along the west side of County Road 37.



St. John and Thim family celebrating a successful well hookup and turning on the wells for the first time. 11/12/2016