

# STREAMFLOW ENHANCEMENT PARTNERSHIPS

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**COZAD CANAL**

**Cozad Ditch Company**

**THIRTY MILE CANAL**

**Thirty Mile Irrigation District**

**ORCHARD/ALFALFA CANAL**

**Southside Irrigation District**

**SIX MILE CANAL**

**Six Mile Canal Company**



**Central Platte Natural Resources District**



## CPNRD Conjunctive Water Management- Canal Projects

The rehabilitation of irrigation canals are the first and largest of Central Platte NRD's conjunctive water management efforts. The project has utilized four canals in Dawson County: Six Mile Canal, Cozad Canal, Thirty Mile Canal and Orchard Alfalfa Canal.

### Why Rehabilitate 100-Year-Old Canals?

You may be wondering why the Central Platte NRD partnered with the surface water entities, since the Nebraska Legislature authorized the NRDs to manage groundwater and not surface water. The process began in 2010 when CPNRD purchased the Six Mile Canal Company; which was the first-ever buyout of a surface water irrigation canal in Nebraska. The Six Mile Canal had been in operation since 1894, withdrawing an average of 2,377 ac/ft of water annually. The purchase agreement provided funding for farmers to convert to groundwater irrigation and the closure of the ditch eliminated river diversions which resulted in an annual savings of 130 ac/ft of water.

The remaining three canals were in major disrepair after nearly a century of providing irrigation; however, it was evident that the canal systems were still very important to this area. So, in 2012, former CPNRD general manager Ron Bishop approached the irrigation companies to negotiate a new way to increase flows to the Platte River by rehabilitating the entire canals. The NRD and the irrigation companies have developed separate and unique partnerships to maintain the canal systems for decades to come.

### Benefits Provided by Projects

The associated surface water rights from the closure of Six Mile Canal are being transferred to the Thirty Mile Irrigation District. The Cozad, Thirty Mile, and Orchard/Alfalfa canals were approved for excess flow rights in March 2015 from the Nebraska Department of Natural Resources. The benefits already seen from these partnerships include:

- Groundwater recharge which enhances surface and groundwater supplies, and protects water quality.
- Enhanced flows to the Platte River by diverting and retiming excess flows; as well as returning natural flow irrigation rights to the river.
- Helps meet the requirements of the Platte River Recovery Implementation Program agreement between Colorado, Wyoming, Nebraska and the U.S. Fish & Wildlife Service.
- Helps meet the LB 962 requirement to return the over-appropriated area of the Platte River to a fully appropriated status.

### Funding

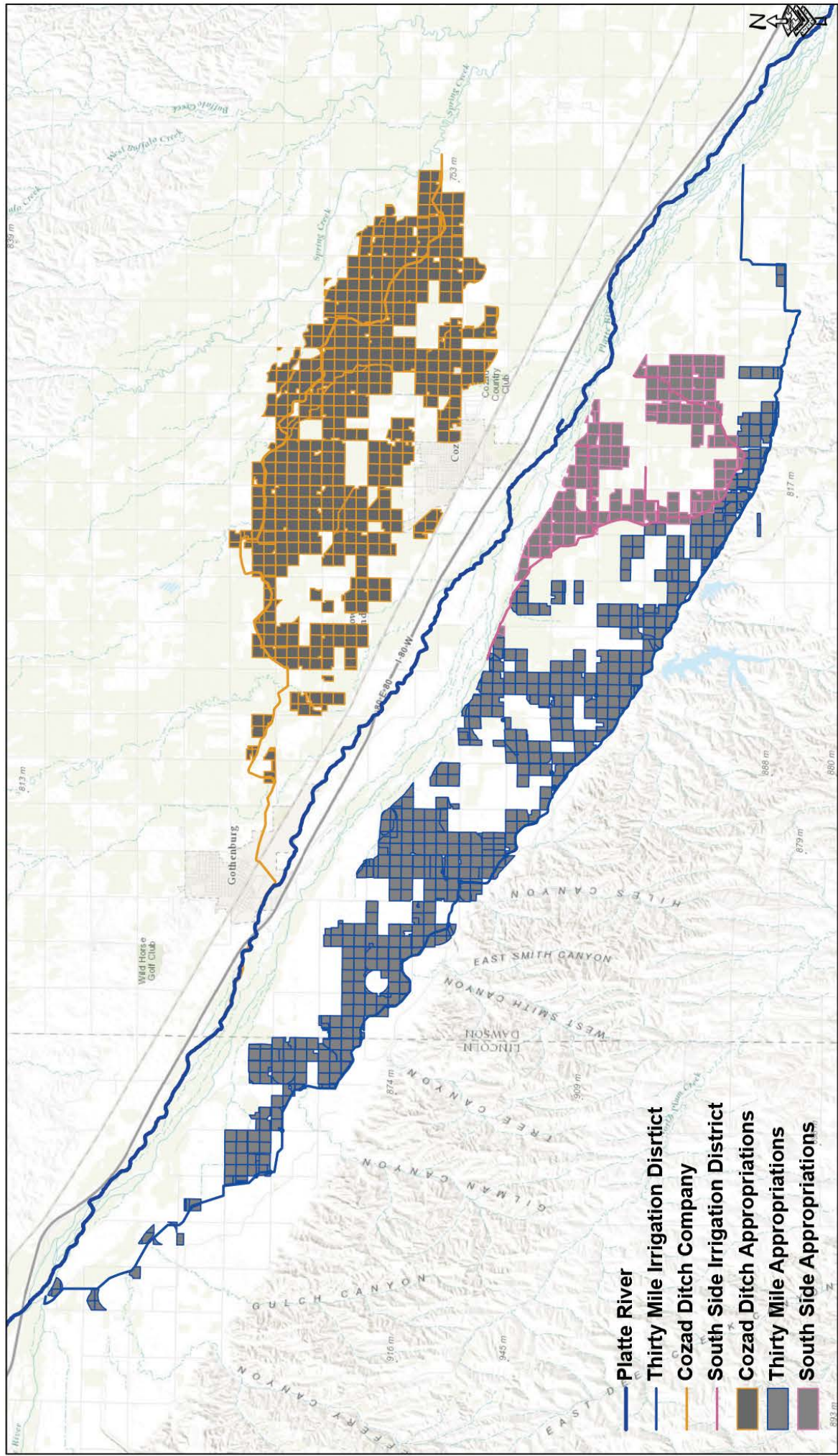
The Cozad Canal and Thirty Mile Canal rehabs were approved as Platte Basin Habitat Enhancement Projects with 40% of funding provided by the Nebraska Department of Natural Resources, 20% by Central Platte NRD, 20% by the Cozad Ditch Company or Thirty Mile Irrigation District, and 20% by the Nebraska Environmental Trust.

The Orchard Alfalfa Canal rehab was approved as a Platte Basin Coalition Project with 60% of funding provided by the Nebraska Department of Natural Resources, 20% by Central Platte NRD, and 20% by the Southside Irrigation District.



# CENTRAL PLATTE NRD SURFACE WATER PROJECTS

CENTRAL PLATTE NRD  
215 KAUFMAN AVENUE  
GRAND ISLAND, NE 68803



# COZAD DITCH COMPANY

The Central Platte Natural Resources District (CPNRD) and Cozad Ditch Company partnered in March of 2012 to create a more efficient irrigation system. Completed in three phases and only two years, this massive project included:

- 27 miles of clearing and grubbing
- 21 miles of grading
- 13 new structures: included 4 farm crossings, 6 check structures, 1 underdrain structure, 1 siphon, and 1 county road wing wall replacement.
- River Return Structure
- Spring Creek Wasteway Structure: excavation of Spring Creek Channel (1,415 LF), 22 walkway modifications/extensions, and a SCADA automated monitoring system of the Rubicon Gates which includes 4 flume gates and 7 slip meters.

## 30-YEAR MANAGEMENT AGREEMENT CPNRD-Cozad Ditch Company

- Cozad Ditch Company will lease water appropriations to Central Platte NRD.
- CPNRD leases 50% interest in Cozad Ditch Company's real and personal property.
- CPNRD leases 50% interest in the water delivery systems in order to assist with continued operations to deliver surface water for irrigation and groundwater recharge as well as to provide enhanced stream flows to the Platte River for State and local purposes, including but not limited to, the Platte River Recovery Implementation Plan, the Platte River Basin-wide Integrated Management Plan, and the CPNRD Platte River Integrated Management Plan, including the return to fully appropriated for the areas in Dawson County and western Buffalo County designated as over-appropriated.
- Cozad Ditch Company and CPNRD use the irrigation canal and laterals to augment ground water recharge and flows to the Platte River.

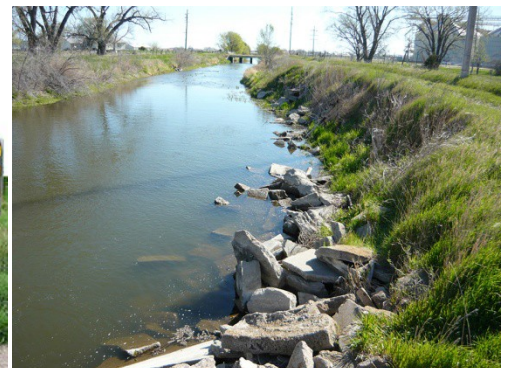
**PROJECT COST \$6,596,860.08** Engineering Firm- Olsson Associates of Grand Island, NE.



(1925): Diversion Point. Canal has been in place and diverting water for 120 years.

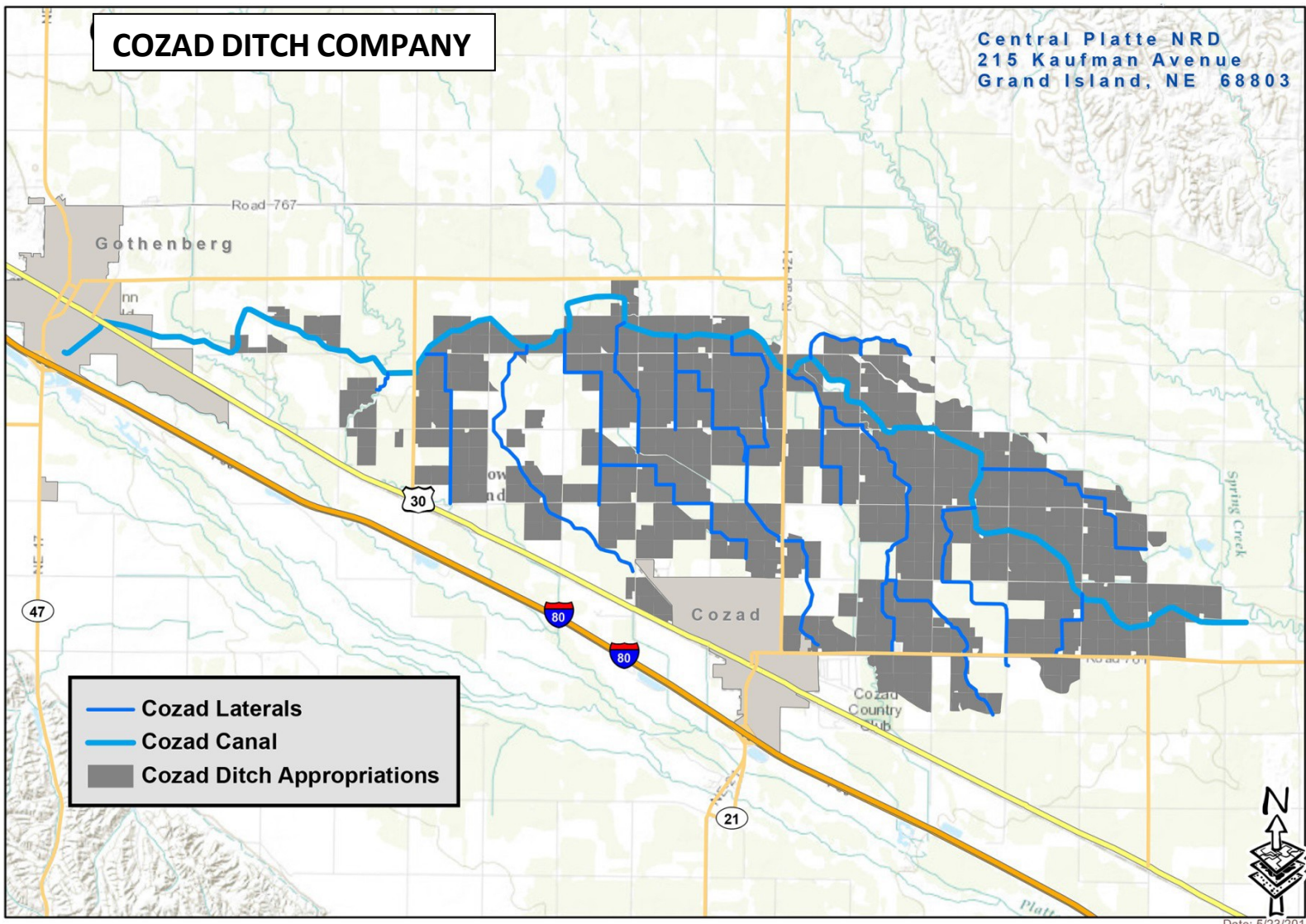


(2012): Channel overgrown with trees and channel in disrepair.



(2014): Channel at headworks holding water as designed.



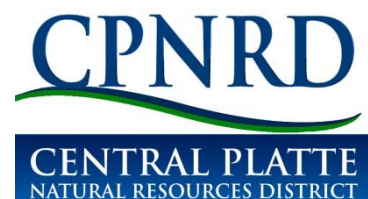


## Water Rights:

This project has the potential to provide 7,000 to 18,000 AF of water savings annually; which will help the CPNRD get closer to a fully appropriated status.

The canal has been in place since its water right was approved in 1894; with water rights to irrigate over 25,000 acres of land in the area between Gothenburg and Lexington in Dawson County.

To date, this partnership resulted in one diversion of excess flow in 2011 totaling 4,365 AF and 2,097 AF in spring 2015. The groundwater return back to the Platte River for 2011 - 2014 is computed to be 418 AF; and 166 AF as of May 2015.





# COZAD DITCH COMPANY

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**5/5/2011**



**5/6/2011**



**1/18/2012**



**1/23/2012**



**2/21/2012**



**11/26/2013**





# COZAD DITCH COMPANY

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**1/14/2013**



**1/14/2013**



**6/6/2013**



**5/29/2014**



**5/29/2014**

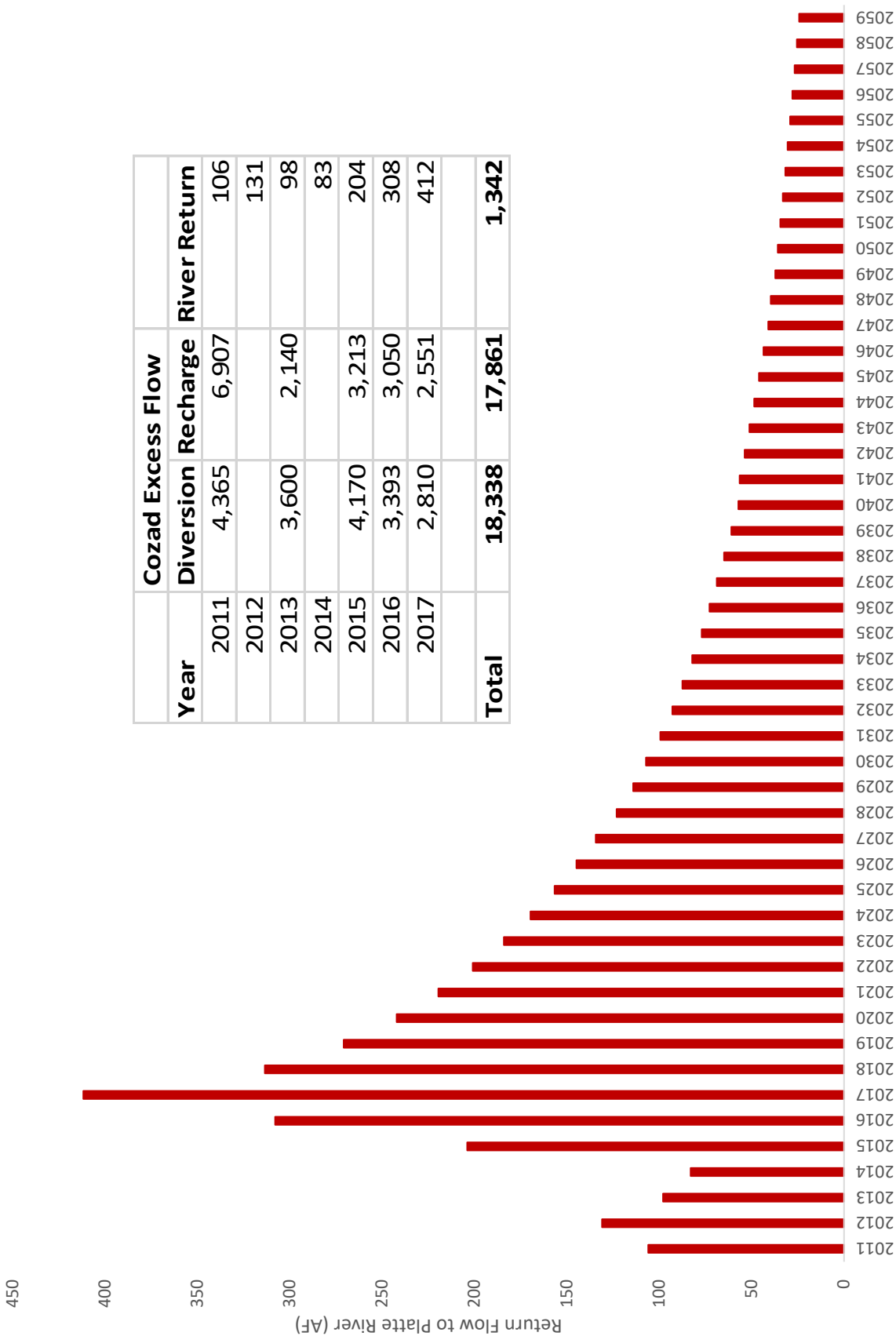


**6/17/2014**





# Cozad Excess Flow Returns to the Platte River







# THIRTY MILE IRRIGATION DISTRICT

The Thirty Mile Canal was originally dedicated on July 13, 1928 with water rights for 15,000 acres. The partnership between the Central Platte NRD and Thirty Mile Canal Company was initiated in January 2012 to create a more efficient irrigation system. The canal company became an irrigation district in September 2013; making the Thirty Mile Irrigation District a political subdivision.

Rehabilitation included replacement and/or installation of:

- 8 bridges
- 8 check structures
- 9 drop structures
- 2 pipe laterals
- 3 pipe roadway crossings
- 4 miscellaneous structures
- 5 flow measurement devices/structures
- installation of rip rap

## MANAGEMENT AGREEMENT

## CPNRD-Thirty Mile Irrigation District

- CPNRD paid \$1.9 million for 50% interest in Thirty Mile Irrigation District's real and personal property and for 50% interest in the water delivery systems.
- An Interlocal Agreement was signed in February 2014, creating the CPNRD-TMID Stream Flow Enhancement Alliance. The agreement outlines the continued maintenance and delivery of surface water for both irrigation and groundwater recharge.
- The partners will use the canal in the non-irrigation season to hold diverted excess Platte River flows when available, will divert allocations that are leased back to TMID, and return the consumptive use portion of the transferred water to the Platte River. The non-consumptive portion of the appropriation will be used for ground water recharge throughout the canal system.

**PROJECT COST \$5,018,982.01**

*Engineering Firm- Miller & Associates of Kearney, NE.*



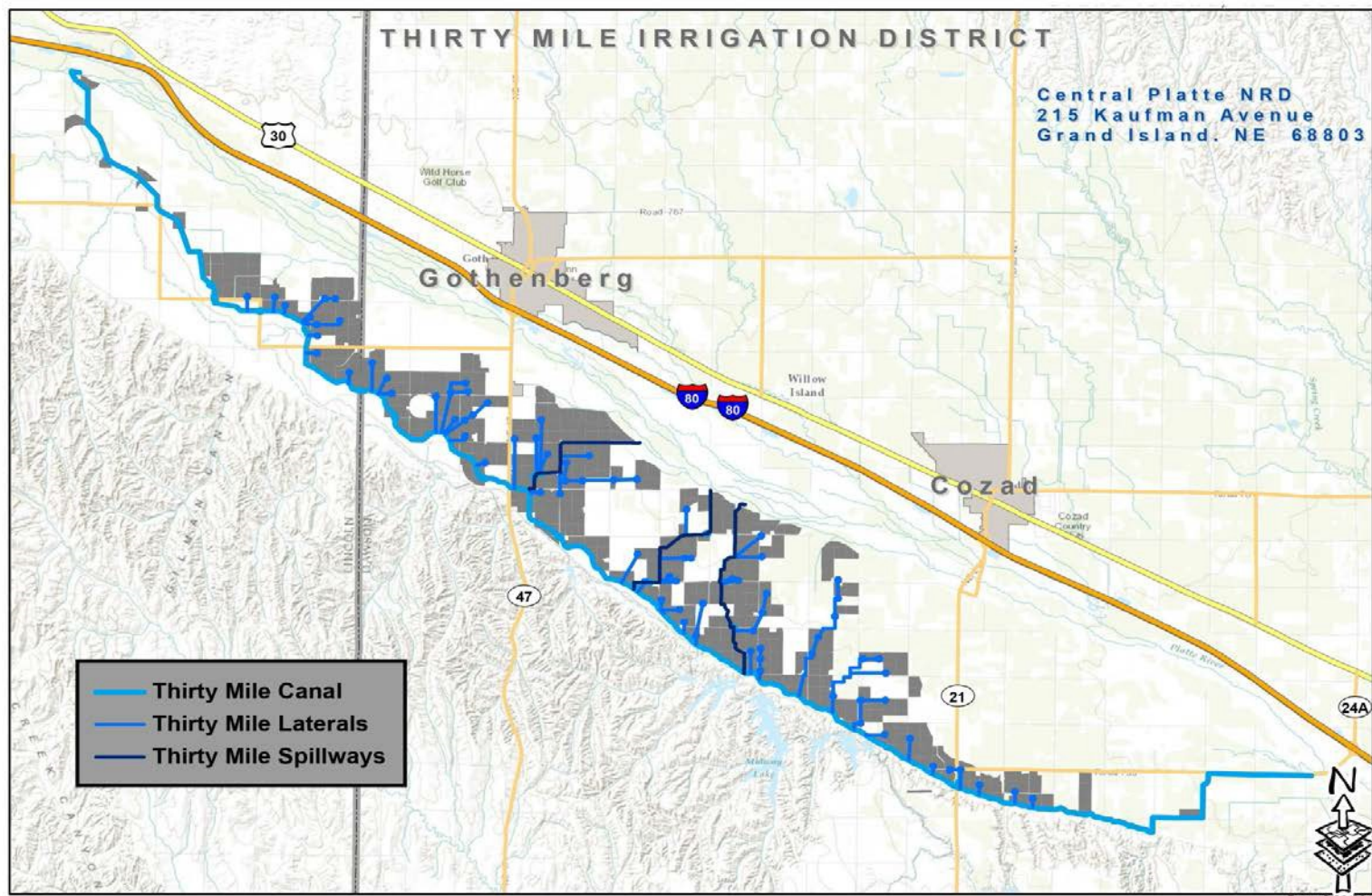
(2012): Photo shows tedious process that was required to remove the massive over-growth of trees along the canal.



(Spring 2014): Completed section of canal holding water.



(Spring 2014): Headworks during PBHEP tour of the canal.



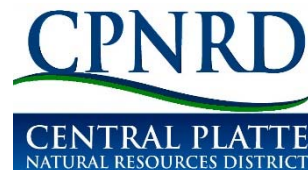
## Water Rights:

This project has the potential to provide 8,000 to 13,000 AF of water savings annually; which will help the CPNRD get closer to a fully appropriated status.

The canal has been in place since its water rights were approved in 1926 and 1927; with water rights to irrigate 15,000 acres of land in the area between Gothenburg and Lexington in Dawson County. The associated surface water rights (1,666 acres) from the closure of Six Mile Canal are being transferred to the Thirty Mile Irrigation District to be put to beneficial use as irrigation and groundwater recharge.

To date, this partnership has resulted in diversions of excess flow totaling 26,352 AF; resulting in groundwater return of 14,856 AF back to the Platte River.

*Over 10,000 people attended the dedication of the original Thirty Mile Canal on July 13, 1928. They traveled by train to see the place “Where IRRIGATION Is Turning a LAND OF PROMISE Into A LAND OF PRODUCTION.” The 1928 dedication program gives you an idea of how large-scale this project was in the ‘20s by stating, “This is the story of a dream come true.” The project was paid for by 121 farmer stockholders at a cost of \$350,000 with no irrigation district formed and no bonds issued. The project was completed 15 months after the first meeting and at a cost of less than \$25 per acre.*





# THIRTY MILE IRRIGATION DISTRICT



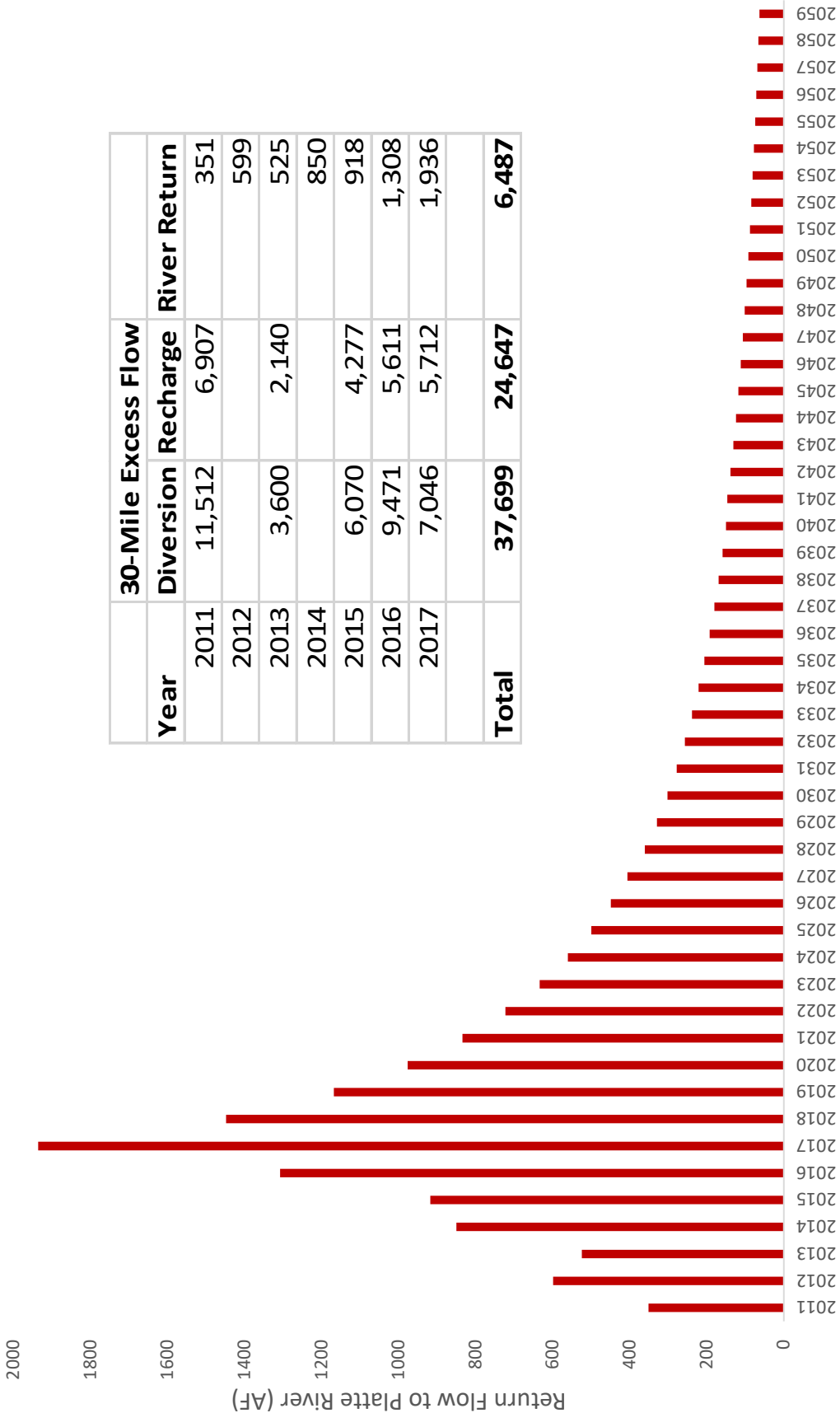


# THIRTY MILE IRRIGATION DISTRICT





### 30-Mile Excess Flow Returns to the Platte River



30-Mile Excess Flow			
Year	Diversion	Recharge	River Return
2011	11,512	6,907	351
2012			599
2013	3,600	2,140	525
2014			850
2015	6,070	4,277	918
2016	9,471	5,611	1,308
2017	7,046	5,712	1,936
Total	37,699	24,647	6,487





# Southside Irrigation District

The Orchard Alfalfa Canal has been in place since its water right was approved in 1898; with water rights to irrigate 4,326 acres of land. The Central Platte NRD and Southside Irrigation Company signed a management-lease agreement in 2012. The canal company became an irrigation district in 2014; making the Southside Irrigation District a political subdivision.

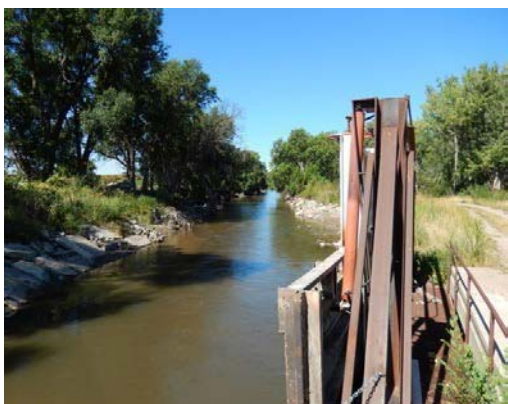
Construction began in 2013 and included:

- replacement of 7 county road box culverts
- 51 acres of clearing and grubbing
- 60,200 LF of grading
- irrigation turnout structures
- removal of 3 farm crossings
- replacement of 13 canal structures
- replacement of diversion structure
- installation of slide gate with electric actuators on existing overflow structure
- rip rap overflow structure for high flows

## 30-YEAR MANAGEMENT AGREEMENT CPNRD-Southside Irrigation District

- Southside Irrigation District will lease water appropriations to Central Platte NRD.
- CPNRD leases 50% interest in Southside Irrigation District's real and personal property.
- CPNRD leases 50% interest in the water delivery systems in order to assist with continued operations to deliver surface water for irrigation and groundwater recharge as well as to provide enhanced stream flows to the Platte River for State and local purposes, including but not limited to, the Platte River Recovery Implementation Plan, Platte River Basin-wide Integrated Management Plan, and the CPNRD Platte River Integrated Management Plan, including the return to fully appropriated for the areas in Dawson County and western Buffalo County designated as over-appropriated.
- Southside Irrigation District and CPNRD use the irrigation canal and laterals to augment ground water recharge and flows to the Platte River.

**PROJECT COST \$4,691,588.72** *Engineering Firm- Olsson Associates of Grand Island, NE.*



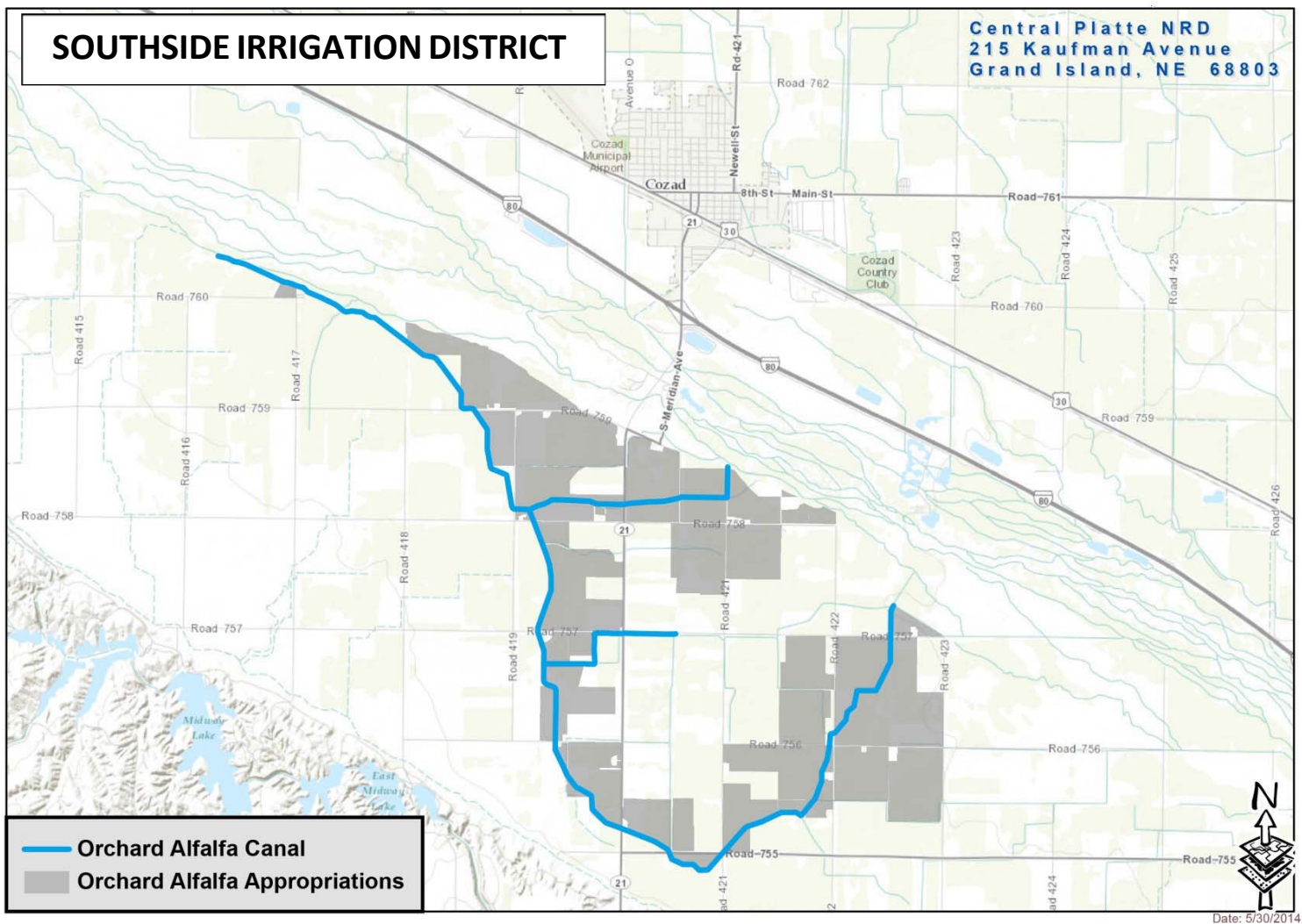
(Spring 2013): Pre-construction photo of the headworks shows over-growth of trees along the canal.



(Fall 2013): Large cranes and crews were common during construction at the headworks.



(Spring 2014): Overflow structure during inspection by Olsson Associates.

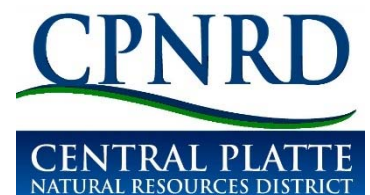


## Water Rights:

This project has the potential to provide 2,500 to 9,900 AF of water savings annually; which will help the CPNRD get closer to a fully appropriated status.

The canal has been in place since its water right was approved in 1898; with water rights to irrigate over 4,326 acres of land.

To date, this partnership has resulted in diversions of excess flow totaling 9,564.3 AF; and 4,752.4 AF in groundwater return back to the Platte River.





# SOUTHSIDE IRRIGATION DISTRICT

9/12/2013



9/20/2013



12/4/2013



12/4/2013



12/4/2013



5/29/2014





# SOUTHSIDE IRRIGATION DISTRICT

5/29/2014



6/17/2014



6/17/2014



6/17/2014



6/17/2014

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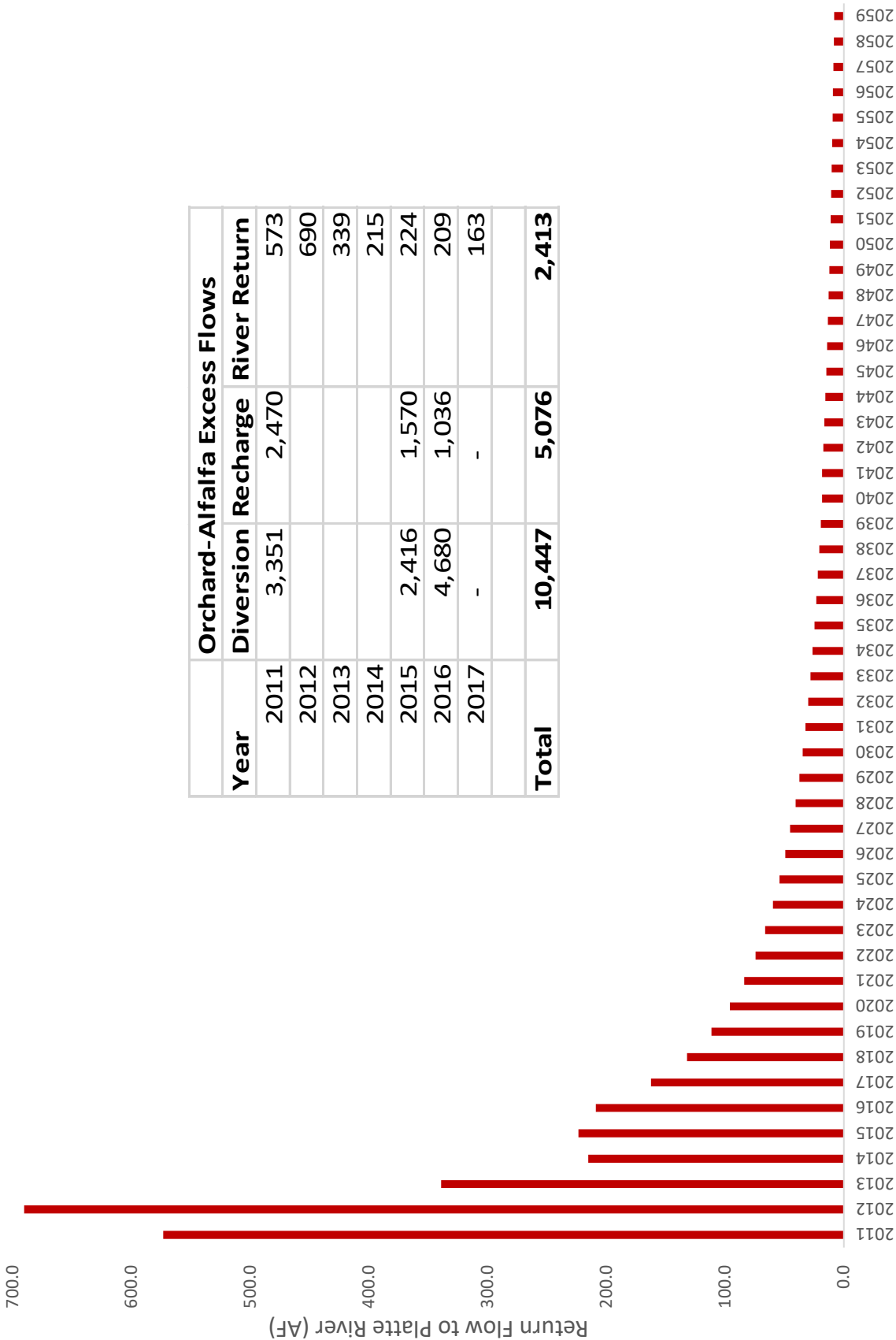


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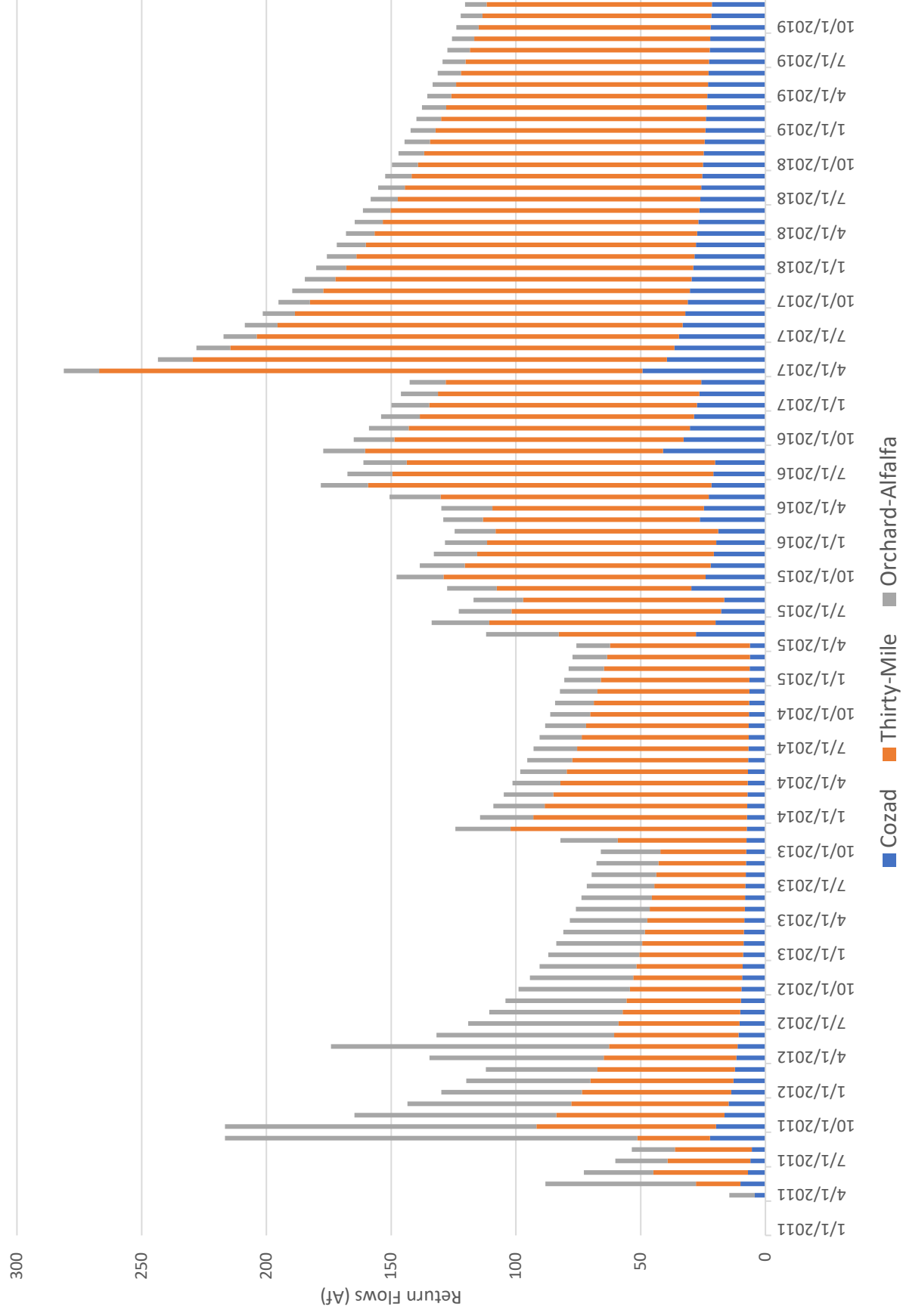
Orchard-Alfalfa Excess Flow Returns to Platte River



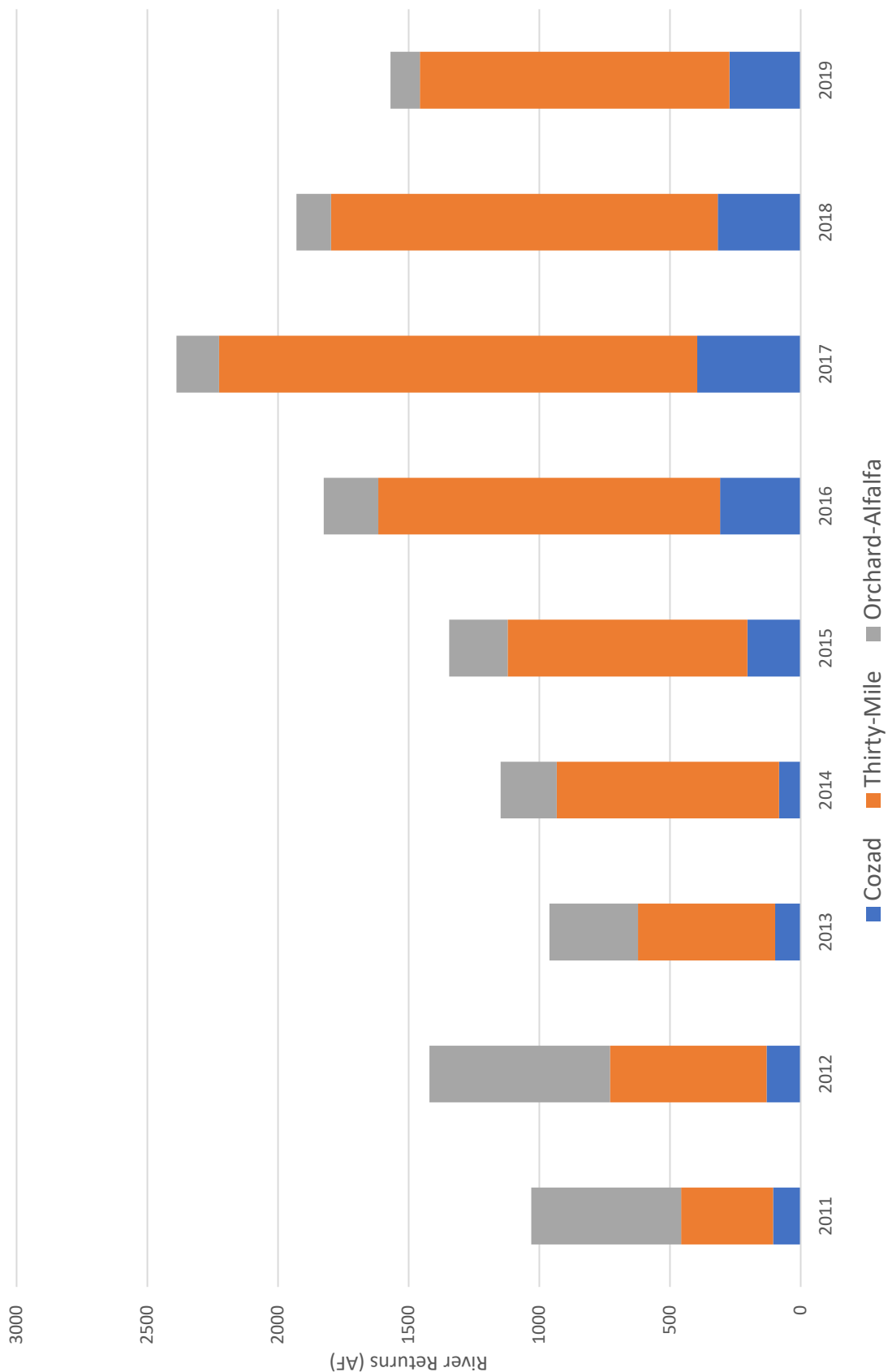




## River Returns Due to Excess Flow by Canal



# Annual River Returns by Canal





# Six-Mile Canal Closing

## CPNRD & Farmers Work Together to Increase Irrigation Efficiency



(Left): Farmers work to close the Six Mile canal to protect water supplies, future users and endangered species by increasing flows to the river.

*"Being able to close the ditch had made these farms much more efficient with longer rows and less turnaround time. I can farm the same amount of land in less time. This increased the productivity and efficiency of our family farm. It also saves fuel and reduces energy costs," said Dawson County farmer Mark Ostergard.*

### HISTORY

The Six Mile Irrigation Canal had been in place and diverting Platte River water since 1894, withdrawing an average of 2,377 acre-feet of water annually. After 116 years of use, more than 30 landowners and farmers along the canal were eager to convert their land to groundwater use. The change provides more efficiency and reliability than surface water, helps protect river flows and endangered species along the Platte.

### BENEFITS of the PROJECT

- Protects water supplies, future users and endangered species by increasing flows to the river.
- Saves farmers fuel and labor costs, improving their bottom line.
- Farms can use new technology that makes irrigation more efficient and helps protect groundwater.
- Allows farmers to efficiently apply nutrients to crops through chemigation systems using center-pivot irrigation.
- Protects lives, saves the county dollars and improves roads through reduced maintenance costs while removing bridges and other hazards to drivers within the road right-of-way.
- Increases productivity and efficiency of the family farm. By filling in the canal farmers have added land to grow crops and longer, more efficient rows on their property.
- Eliminating the canal, increases flow to the river and irrigates the same amount of acres.



(Above): The Six Mile Irrigation Canal at its peak, provided irrigation water to approximately 1,700 acres and multiple landowners. (Below) After the removal of the canal, field rows are longer which saves farmers time and fuel.

*"This project allows us to return water to the river which will help protect endangered species, make irrigation more efficient for farmers, put more land into crop production and improve public safety," said Ron Bishop, former general manager of the Central Platte NRD.*



# Six-Mile Canal Closing

*“County and state roads also benefited from the removal of the Six Mile canal which makes roads wider and safer. It really has been an improvement for the roads. It was a relief for us. The narrow crossings made roads dangerous and now they are as wide as they need to be,” said Tim Wolf, road foreman for Dawson County Department of Roads.*



*(Above): The removal of the canal protects lives, saves the county dollars and improves roads through reduced maintenance costs by removing bridges and other hazards to drivers within the road right-of-way.*



*“I can now irrigate with a touch of a button on my cell phone which can turn my pivot on or off and saves me time and labor,” said Roger Wahlgren, Six Mile Canal Board Member.*

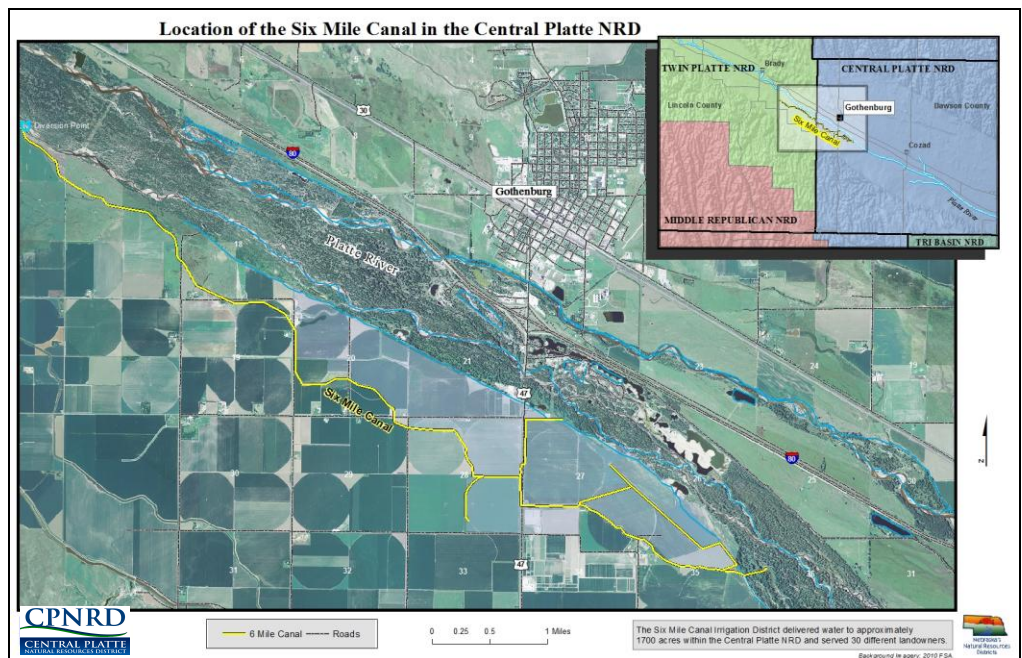


*(Right): Farmers can now take advantage of new technology such as using cell phones to operate pivots and check fields.*

*“Fields are now more aesthetically pleasing and level since the canal has been pushed in. Also, it was difficult to irrigate when there was no water in the ditch. With groundwater I don’t have to worry about reliability of surface water during early season irrigation,” said Pat Hecox, Dawson County farmer.*



*(Above): Diversion gates from the Platte River to the Six Mile Canal.*



*(Right) Map of the Six Mile Canal.*

## Returning Water to the Platte River