

MINUTES OF THE  
2015 ANNUAL BASIN-WIDE PLAN MEETING FOR  
JOINT INTEGRATED WATER RESOURCES MANAGEMENT OF  
OVERAPPROPRIATED PORTIONS OF THE PLATTE RIVER BASIN

June 18<sup>th</sup>, 2015 1:00 p.m. CDT

North Platte Holiday Inn Express & Suites  
300 Holiday Frontage Road, North Platte, Nebraska

**Attendance:**

|                      |       |                   |        |
|----------------------|-------|-------------------|--------|
| Melissa Mosier       | NDNR  | Rod Horn          | SPNRD  |
| Kathy Benson         | NDNR  | Travis Glanz      | SPNRD  |
| Jennifer Schellpeper | NDNR  | John Berge        | NPNRD  |
| Jim Schneider        | NDNR  | Tracy Zayac       | NPNRD  |
| Jessie Wietjes       | NDNR  | Dean Edson        | NARD   |
| Kayla Sharp          | NDNR  | Kyle Ann Hopkins  | NPNRD  |
| Amy Zoller           | NDNR  | Mike Drain        | CNPPID |
| Duane Woodward       | CPNRD | Kent O. Miller    | TPNRD  |
| Jesse Mintken        | CPNRD | Tammy Fahrenbruch | TBNRD  |
| Landon Shaw          | TPNRD | Brian Barels      | NPPD   |
| Ann Dimmitt          | TPNRD | Jeff Shafer       | NPPD   |
| Nolan Little         | TBNRD |                   |        |
| Larry Reynolds       | TBNRD |                   |        |

- 1) **Introductions:** The attendance sheet is included as Attachment A.
- 2) **Review Agenda & Meeting Procedures:** Miller stated the procedure of the meeting is that the five NRDs and the DNR will provide information on the progress of the Platte Basin-Wide Integrated Management Plan (IMP) in the overappropriated portion of the Upper Platte Basin with a time at the end for questions from the public. The meeting agenda is included as Attachment B.
- 3) **Monitoring & Management Actions**
  - a) **DNR Report:** Wietjes reported that between January 1, 2014 and December 31, 2014, the Department issued seven surface water permits for temporary recharge that expire after one year. Two dam safety permits were issued for storm water management, and two municipal/industrial groundwater transfers with no new or expanded consumptive uses. There was one cancelled water surface permit. Activities tracked on a five-year basis were livestock and human population, and sandpits and reservoirs less than 15 acre feet. The Department is currently working with the NRDs on the larger Robust Review.

**b) NRD Reports**

- i) CPNRD:** Mintken provided the report for CPNRD. The CPNRD currently has 1,027,280 certified irrigated acres, of which 933,000 acres are groundwater, 14,000 acres are surface water, and 77,600 acres are for co-mingled use. The irrigated-acre base has increased 10,700 acres due to continued certification. For 2014, there were 226 transfers with 2,762 acres within those transfers being newly certified acres, and 18,027 acres used for offsets. These transfers did not generate net increases. Out of 196 well permits, one was voided. Two perpetual conservation easements were acquired on the water rights in Dawson County in the overappropriated area. The estimated accretion using the COHYST calculator is 44.73 acre-feet. At the close of 2014 the water bank had 2,504 acre-feet of water rights available for offset. Other streamflow accretion activities included Elm Creek Reservoir, the rehabilitation of three surface water canals, and conjunctive water management studies. Last year CPNRD started a new crop irrigation and demand network project wherein CPNRD partnered with others to collect daily pump records on selected irrigation wells and surface water users wherein the information could be provided to the NRDs and the farm operators. To date there are 79 data collection sites established across the 24 management areas.
- ii) NPNRD:** Berge reported that NPNRD had 343.6 new acres certified in 2014. One transfer was approved for 69 acres of the 115 petitioned due to the net depletions it would have caused the North Platte River. Other water use activities included 14 well construction permits which were mostly replacement wells, monitoring of irrigation use through 2,100 meters, 440 retired groundwater-only acres, and two five-year surface water agreements on the Enterprise Irrigation District. NPNRD continues to negotiate for additional retirements of about 1,500 acres that will hopefully be included in next year's annual report. In the past year, metering was also expanded to include the fully appropriated area and it is hoped that will be completed by 2016.
- iii) SPNRD:** Glanz reported that SPNRD approved 14 transfers: seven were certified acres that were moved to allow for new pivots, six industrial transfers requiring DNR permits, four transfers did not require permits or notices, and one transfer involved constructing new waste water lagoons in the city of Chappell. Five replacement wells were issued, with eight total variances, of which four were allowed transfers. SPNRD has 27 non-baseline certifications of which ten had or could have had an active industrial use in 2014, eight baseline certifications which had to install flow meters, and 11 industries that have established baselines. All ten of the municipal water systems in the district have baselines. Flow meter data shows about nine inches per acre of which corn is almost 50% of the crop. At the end of 2014, there were 1,412 retired acres which gave an estimated 580 acre-feet of water back to Lodgepole Creek. In other activities, SPNRD began work on the WWUM, and the Nebraska Environmental Trust grant for the Hydrogeology of Western Nebraska to study the oil and gas logs.

- iv) **TBNRD:** Little reported that TBNRD had 299,000 certified acres in the Platte Basin portion of the District. In 2014, TBNRD approved 10 certified irrigated acre transfers, no new irrigation wells, 29 replacement irrigation wells, 13 conditional replacement irrigation wells, one dewatering well, and one domestic well. Just over 60% of the Platte Basin is metered with 418 flow meters. TBNRD drilled one augmentation well. Static water results were affected by the storms that occurred in the spring.
- v) **TPNRD:** Dimmitt reported that in 2014, TPNRD had 321,000 certified irrigated acres and approved 31 transfers involving 1,253 acres. The TPNRD's water bank accepted 150 acres, but it is expected that many of these will only remain there for less than one year. TPNRD issued 17 replacement well permits, and 18 new well permits. They continue to work with municipal and industrial users in the establishment and maintenance of annual baselines. All the industrial users now have flow meters installed. TPNRD has also been involved in a number of streamflow accretion projects, including N-CORPE, and the diversion of excess flows for groundwater recharge in the irrigation districts. TPNRD continued working with DNR on the J-2 Regulating Project.

c) **Data, Information, Studies**

i) **Progress Toward Increment Goals (measuring the success of the IMPs)**

1. **Annual Review (DNR):** Wietjes reported on the "Report on the Depletions and Mitigations (Accretions) from 2014 Permitted Activities for Central Platte, North Platte, South Platte, Tri-Basin, and Twin Platte Natural Resources Districts for the 2015 Basin-Wide Meeting." The required activities for analyses in this year were the NRD transfers. CPNRD had 214 permits, NPNRD one permit, SPNRD three permits, TBNRD nine permits, and TPNRD 32 permits. All of the net impacts were positive and the overall total net effect through first increment of the plan shows a positive effect near 70 acre-feet in 2014 growing to almost 150 acre-feet positive effect by the year 2019.

2. **Robust Review**

a. Wietjes reported that the NRDs and DNR are working together on a scope of work for how to conduct the Robust Review that is required by the IMPs. The goal is to analyze the impacts from all the activities reported annually as well as the other mitigation projects such as canal recharge projects, the augmentation well projects with TBNRD, and any additional new uses. This work is projected to start this fall.

3. **Projects**

a. **Fall 2013 Recharge Projects (DNR):** Wietjes reported on the canal recharge projects done collaboratively with the NRDs and irrigation districts on diversions of excess flows (Attachment C). Conjunctive management is a process used wherein available water supplies are maximized to get the most benefit, while the need for regulatory actions to

sustain existing water uses is minimized. In 2011, a canal recharge project was conducted to divert excess flows into irrigation canals in the Upper Platte Basin to provide recharge and accretions to the Platte River and alleviate impacts of flooding. The diversion water was measured and monitored and analysis was done on the potential accretions to the river over time. A total of 142,000 acre-feet of water was diverted, of which 64,000 acre-feet were recharged and it was estimated that by 2019 that approximately 15,000 acre-feet will be realized as accretions back to the Platte River. This is annual average around 1,500 acre-feet per year. In 2013, a similar project was conducted as a result of an extreme rainfall event in the upper South Platte Basin near Denver, Colorado. The USGS and other streamflow gages were monitored to track when peak flows would hit the Nebraska state line. Peak flow in the South Platte occurred on September 18<sup>th</sup>, at 21,000 cubic feet per second. Permitting and preparations were made to divert the water into irrigation canal. The experience gained from the 2011 project allowed this process to go smoothly. Flooding is occurring on the Platte River again this year due to above average snow melt in Colorado and above average precipitation this spring. Streamflows were monitored and permits were put in place. Excess water went into canals for recharge prior to the irrigation season and excess flows have also been stored in ponds, lakes, and reservoirs. Canals used in 2015 were the same ones used in 2013 on the South Platte River. There are no preliminary estimates as of yet on the amount of water recharged or the resulting accretions for 2015, but those results will be shared when they become available and analysis is complete.

- b. Lease and Recharge Agreements (NPNRD):** Berge reported on the Cow-Camp Project (Attachment D). There are 386 acres of water rights with 327 irrigated acres: 198 acres of flood irrigation and 129 acres of sprinkler irrigation. High water-use crops of corn and alfalfa were farmed with good yields and thorough records. It was a goal for the NPNRD to protect historic return flows. Consumptive uses were analyzed and the average credit on this farm per year is 688 acre-feet. The cost benefit analysis of this project was \$325 per acre per year. The land owner on this project has been cooperative and desires to stay in the project. Berge reported that 12-15 test holes were drilled on this farm for the best area of recharge. Structures were built for direct return which is a great benefit in consumptive use credit even if nothing else is done.
- c. Lease and Recharge Agreements (TPNRD):** Dimmitt reported work done on irrigation ditches and that feedback from irrigation districts and farmers has been good. They realize the need of conjunctive management to recharge the aquifer. This work started in 2011 with a five-year temporary lease agreement. This is the fifth year that TPNRD has been able to divert water. TPNRD has used the recharge pits on the Western Irrigation Ditch of the South Platte River, which has worked well.

TPNRD has calculated that over 50,000 acre-feet can go back to the river over the next 50-60 years. TPNRD will be working an engineering analysis with some of the ditches to help improve their condition.

**ii) Evaluating the Need for a Subsequent Increment**

**1. Identify the Difference between Over and Fully Appropriated**

- a. Conservation Measures Study (DNR):** Wietjes reported that Phase II of the Study has started, which consists of modeling analyses looking at the impacts of irrigation practices and tillage practices. Full center pivot irrigation with 95% efficiency across the model area vs. gravity irrigation with 65% efficiency to get an estimate of what the impacts are on the streamflows to the river. Also in the study, conventional tillage practices of the 1950s are being compared to no-till practices across the modeled area and comparing those for the potential impacts to streamflows. Flatwater Group and other subcontractors are helping with the modeling and the work has already begun. Results should be finalized later in 2015.
- b. New FAB Evaluation Methodology (CPNRD):** Woodward reported that contracts have been signed with HDR and ARI to calculate the water supply based on the different gaging stations up and down the Central Platte River to the state line. The next step will be the water demands and uses, statistical data, and the hydro demands. The goal is to have this completed by fall.

**4) Second Increment Basin-Wide Planning**

- a. Planning for the Stakeholder Process:** Schneider shared that DNR has worked with the UNL Public Policy Center on public related issues and have asked them to give input into the stakeholder process to improve it. Schellpeper reported that discussions between DNR and the NRDs have begun. August 2015 is the kick-off meeting for pre-planning and then possibly two more meetings after that in this year. The full stakeholder process will hopefully start in the beginning of 2016 and the integrated management plan completed by fall of 2019 (Attachment E). The Public Policy Center will be doing interviews to prepare for the August meeting.

**5) Written Requests for Revisions to the Basin-Wide Plan or to Individual IMPs or Disputes:** Miller reported no revisions to either the Basin-Wide Plan or the Individual IMPs.

**6) Public Comment Period:** Public comments were made by the following meeting attendees:

- **Brian Barels:** Mr. Barels is a Water Resources Manager with NPPD. He offered appreciation for the work that has been done in the Basin and stated Nebraska has been a leader in the water area. He supports the conjunctive management projects in the surface water area, and reminded attendees that there is a historical recharge component to the operations in that the canals do have existing conditioning flows that would be added to at this point.

- **Mike Drain:** Mr. Drain, representing CNPPID, also shared his gratitude on the work being done.

**7) Meeting Summary**

**a) Action Items:** None

**b) Schedule Next Annual Meeting:** The 2016 Annual Meeting for the Upper Platte Basin-Wide Plan will be on June 16, 2016, at 1:00 p.m. CT, with DNR as host. Location to be announced.

# UPPER PLATTE BASIN-WIDE IMP ANNUAL MEETING

Meeting Date: June 18, 2015

Place/Room: Holiday Inn Express & Suites, 300 Holiday  
 Frontage Rd., North Platte, NE


| Name:                | Representing:    | E-Mail:                           |
|----------------------|------------------|-----------------------------------|
| MELISSA MOSIER       | NDNR             | melissa.mosier@nebraska.gov       |
| Kathy Benson         | NDNR             | Kathy.benson@nebraska.gov         |
| ROD L. HORN          | SPNRD            | rhorn@spnrd.org                   |
| Travis Glanz         | SPNRD            | tglanz@spnrd.org                  |
| Duane Woodward       | CPNRD            | woodward@cpnrd.org                |
| JESSE MINTKEN        | CPNRD            | mintken@cpnrd.org                 |
| Nolan Little         | TBNRD            | nlittle@tribasinnrd.org           |
| LARRY REYNOLDS       | Tri-Basin        | larry.reynolds68@gmail.com        |
| Kent O. Miller       | Twin Platte NRD  | komiller@tpnrd.org                |
| JOHN BERGE           | NORTH PLATTE NRD | jberge@npnrd.org                  |
| Tracy Zayac          | North Platte NRD | tzayac@npnrd.org                  |
| Jennifer Schellpeper | NDNR             | jennifer.schellpeper@nebraska.gov |
| Jim Schneider        | NDNR             | jim.schneider@nebraska.gov        |
| Jessie Wietjes       | NDNR             | jessie.wietjes@nebraska.gov       |
| DEAN EDSON           | NARD             | dedson@nodnet.org                 |
| Kayla Sharp          | NDNR             | kayla.sharp@nebraska.gov          |
| Kyle Ann Hopkins     | NP NRD           | khopkins@npnrd.org                |
| Brian Bavel          | NPPD             | bbavel@nppd.com                   |
| Jeff Shafer          | NPPD             | jtshafe@nppd.com                  |
| Mike Drain           | ENPPID           | mdrain@enppid.com                 |





AGENDA  
PLATTE RIVER BASIN-WIDE PLAN  
June 18<sup>th</sup>, 2015 1:00 p.m. CT  
North Platte Holiday Inn Express & Suites  
300 Holiday Frontage Road, North Platte, Nebraska

- 1) Introductions
- 2) Review Agenda & Meeting Procedures
- 3) Monitoring & Management Actions
  - a) DNR Report
  - b) NRD Reports
    - i) CPNRD
    - ii) NPNRD
    - iii) SPNRD
    - iv) TBNRD
    - v) TPNRD
  - c) Data, Information, Studies
    - i) Progress Toward Increment Goals (measuring the success of the IMPs) & Evaluating the Need for a Subsequent Increment
      1. Annual Review
      2. Robust Review
      3. Projects
        - a. Presentations
          - i. DNR – Fall 2013 Recharge Projects
          - ii. NPNRD – Lease and Recharge Agreements
          - iii. TPNRD – Lease and Recharge Agreements
        4. Identify the Difference between Over and Fully Appropriated
          - a. Conservation Measures Study
          - b. New FAB Evaluation Methodology
- 4) Second Increment Basin-Wide Planning
  - a) Planning for Stakeholder Process
- 5) Review of Revisions to the Basin-Wide Plan or to Individual IMPs
- 6) Written Requests for Revisions to the Basin-Wide Plan or to Individual IMPs or Disputes
- 7) Public Comment Period
- 8) Meeting Summary
  - a) Follow-up Items
  - b) Schedule Next Annual Meeting



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**Canal Recharge Opportunities and Successes**

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JESSIE WIETJES, Integrated Water Management Analyst  
 Nebraska Department of Natural Resources

**Outline**

- Background
- 2011 Pilot Project
- 2013 South Platte Flooding
- 2015 Platte Flooding






**WATER AVAILABILITY &  
 WATER SHORTAGES**



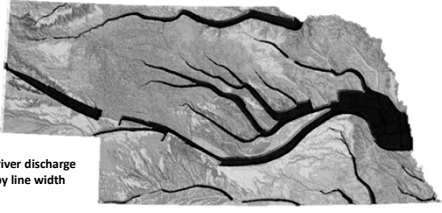
**Water Availability & Water Shortages:  
 Challenges**

- Variable water supplies
- Existing groundwater and surface water uses within Nebraska
- External factors – Compacts and Agreements


**Water Availability & Water Shortages:  
 Surface Water**

**Average Annual Precipitation**  
 86,000,000 acre-feet



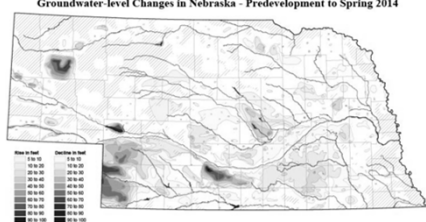
Quantity of river discharge indicated by line width

**Average Annual Streamflow**  
 Total Flow In = 1,000,000 acre-feet  
 Total Flowing Out = 7,100,000 acre-feet





**Water Availability & Water Shortages:  
 Groundwater**

**Groundwater-level Changes in Nebraska - Predevelopment to Spring 2014**




COMPILED AND CHECKED BY: [List of names]  
 U.S. Geological Survey  
 Nebraska State Office  
 1000 North 17th Street  
 Lincoln, NE 68508  
 December 2014






## CONJUNCTIVE MANAGEMENT




## What are the benefits of CWM?

- Maximize the available water supplies
- Leverage existing infrastructure
- Utilize existing planning framework
- Minimize the need for regulatory actions






## CANAL RECHARGE PROJECTS

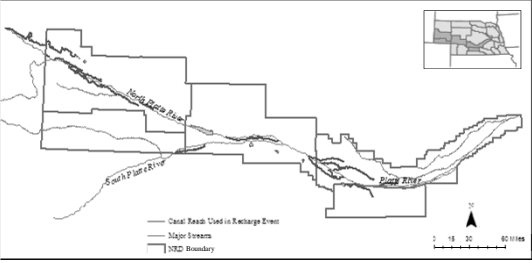



## Pilot Project

- High flows in spring of 2011 prior to irrigation season
- Work with NRDs, Irrigation Districts/Canal Companies to arrange Permitting
- Diversions of Excess Flows
- Diversion and return measuring and monitoring


## 2011 Canals

## 2011 Demonstration Project

- For groundwater recharge and flood reduction
- Partners
  - 23 Canals
  - DNR
  - South Platte
  - Tri-Basin
  - Twin Platte
  - Central Platte
  - North Platte
- Results:
 

|                                 |                      |
|---------------------------------|----------------------|
| ▪ Diversion Total               | 142,000 a-f          |
| ▪ Recharge Total                | 64,000 a-f           |
| ▪ 2011-2019 Accretion Total     | 15,000 a-f           |
| <b>Average annual accretion</b> | <b>~1,500 a-f/yr</b> |



### 2013 Flood Flow Project

- Flooding in Eastern Colorado due to extreme rainfall September 2013
- Peak period of rainfall (6 PM Tuesday – 6 PM Wednesday)
- Cumulative Rainfall at Estes Park rain gage

Cumulative Rainfall ESP (Estes Park Rain gage) for the period of Monday Sept. 9th - Sunday Sept. 15th, 2013

### 2013 Flood Flow Project

- Preliminary estimated peak flows at various points in the South Platte River Basin

| GAGE | 2013 PEAK (preliminary)                        | NEW RECORD | PREVIOUS/CURRENT RECORD       | COMMENT                      |
|------|--|------------|-------------------------------|------------------------------|
| 1    | Bear Creek at Morrison 9.1'                    | No?        | 9.2 on 9/1/1938               |                              |
| 2    | Clear Creek at Golden 6.8; 1550 cfs            | No         | 2370 cfs on 7/10/1983         |                              |
| 3    | Boulder Creek at Boulder 8.2; 5,000 cfs        | No         | -11,000 cfs on 5/30/1894      | 1894 estimated               |
| 4    | St. Vrain Creek at Lyons >8.8'                 | Yes?       | 8.1; 10,500 cfs on 6/22/1941  | Gage destroyed 2013          |
| 5    | N. Fork Big Thompson R. Drake 10.2'            | Yes        | 9.3 on 7/31/1976              |                              |
| 6    | Big Thompson Canyon Mouth 5.8.2'               | Maybe      | -19.9; -11,000 cfs on 7/31/76 | Gage destroyed 2013 and 1976 |
| 7    | Poudre R. at Ft. Collins 10.8; 8420 cfs        | Yes?       | 10.5; 7,710 cfs on 4/30/1999  | Gaged since 1975             |
| 8    | S. Platte R. near Fort Morgan 24.7; 50,600 cfs | No         | 83,700 cfs on 5/31/1935       |                              |

Preliminary flood peaks from selected gages on Front Range drainages affected by flooding, September 2013, compared with previous flood peaks. (Data: USGS, Colorado DWR, GRC/D)

### 2013 Flood Flow Project

- South Platte flows peaked at stateline gage on September 18<sup>th</sup>, 2013 (21,000 cfs)

South Platte River Bridge, Highway 83, North Platte, NE  
 Friday, September 20, 2013 at 8:45 a.m.

South Platte River Bridge, Highway 83, North Platte, NE  
 Friday, September 21, 2013 at 11:30 a.m.

### 2013 Excess Flow Project

- Diversion projects were quickly coordinated by DNR, NRDs, and irrigation districts

South Platte River Bridge, Buffalo Bill Road, North Platte, NE  
 Friday, September 20, 2013 at 8:30 a.m.

South Platte River Bridge, Buffalo Bill Road, North Platte, NE  
 Saturday, September 21, 2013 at 9:00 a.m.

### 2013 Flood Flow Project


USGS 06764880 South Platte River at Roscoe, Nebr.

### 2013 Canals

### 2013 Demonstration Project


- For groundwater recharge and flood reduction
- Partners
  - 9 Canals
  - DNR
  - South Platte
  - Tri-Basin
  - Twin Platte
  - Central Platte
- Results:
 

|                             |                  |
|-----------------------------|------------------|
| ▪ Diversion Total           | 44,000 a-f       |
| ▪ Recharge Total            | 27,000 a-f       |
| ▪ 2011-2019 Accretion Total | 5,600 a-f        |
| <b>Total Cost</b>           | <b>\$707,748</b> |




### 2015 Flood Flow Project

- Above average snowmelt and precipitation in spring 2015 in Colorado
- Monitored streamflows, work with irrigation districts and NRDs to get permits in place and prepare
- Divert into canals until irrigation season
- Store excess flows in ponds, pits, lakes, and reservoirs

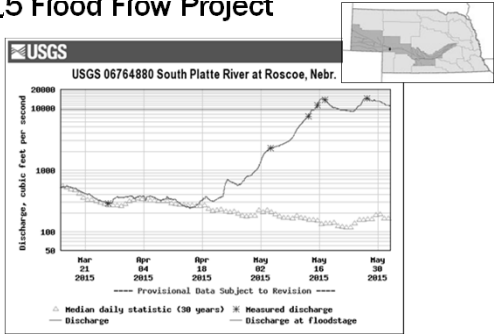



### 2015 Flood Flow Project

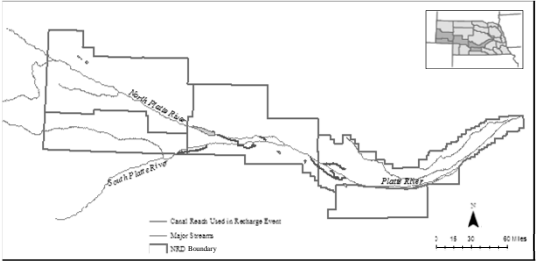

- Expecting high flows into mid-summer
- Potential for higher flows in North Platte River as well
- Will continue to divert as long as excess exist (target flows are met) and storage available



### 2015 Flood Flow Project





### 2015 Canals

### Summary

- DNR and partners are using CWM to maximize benefits to water users while minimizing negative impacts on streamflow and groundwater levels
  - The 2013 Flood Flow Project demonstrated that DNR and partners are able to quickly coordinate CWM projects
- Benefits of current CWM projects will continue to emerge in the future






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**THANK YOU**

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JESSIE WIETJES, Integrated Water Management Analyst  
Nebraska Department of Natural Resources  
402-471-0376  
dnr.nebraska.gov  

## NORTH PLATTE NRD SURFACE WATER RECHARGE PROJECTS

### COW CAMP AND RUSH/ROGERS PROJECTS

By John Berge  
General Manager  
North Platte NRD


**NORTH PLATTE**  
Natural Resources District




## Cow Camp Project Overview

- ⦿ Leased 350.7 acres at \$325/acre/year
- ⦿ Annual lease cost of \$113,977.50
- ⦿ 5 year lease with option to renew at end of lease


**NORTH PLATTE**  
Natural Resources District



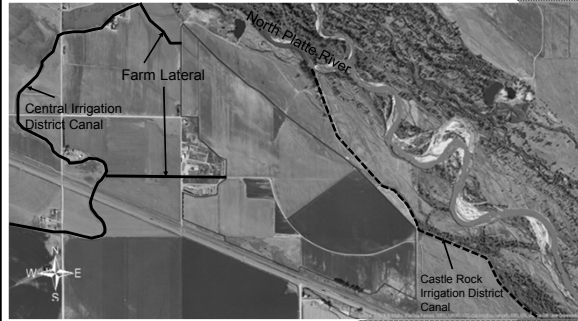
## Cow Camp Project Location




**NORTH PLATTE**  
Natural Resources District



## Cow Camp Project Farm




**NORTH PLATTE**  
Natural Resources District



## Cow Camp Historic Farm Statistics

- ⦿ 386 Acres of Water Rights under the Central Irrigation District
- ⦿ Total of Approximately 327 Historic Irrigated Acres
  - 198 acres of flood irrigation
  - 129 acres of sprinkler irrigation
  - Mostly corn and alfalfa rotation
  - Farmed continuously for the entire study period
  - Good yields and records


**NORTH PLATTE**  
Natural Resources District



## Cow Camp Historic Consumptive Use Analysis

- ⦿ Determine Historic Irrigated Crop Water Use
  - Use this water as credits toward NPNRD obligations
  - Water will be recharged and/or directly returned to the North Platte River
- ⦿ Determine Historic Canal Loss and Irrigation Inefficiency Return Flows
  - These will be preserved to protect downstream water rights

**NORTH PLATTE**  
Natural Resources District



### Data Acquired for Historic CU Analysis

- Records Gathered for Analysis
  - FSA Records (USDA FSA)
  - Canal Diversion Records (Nebraska DNR)
  - Soils Information (NRCS)
  - Elevation Information (USGS)
  - Weather Information (Scottsbluff Airport Weather Information on NOAA)
  - On Farm Information (Farm Interviews)
  - Canal Loss and Lateral Information (Irrigation District Interview)

### Historic CU Analysis Method Irrigation Demand Calculation

Potential Evapotranspiration  $-$  Precipitation  $=$  Irrigation Demand

### Historic CU Analysis Method Crop Water Supply Calculation

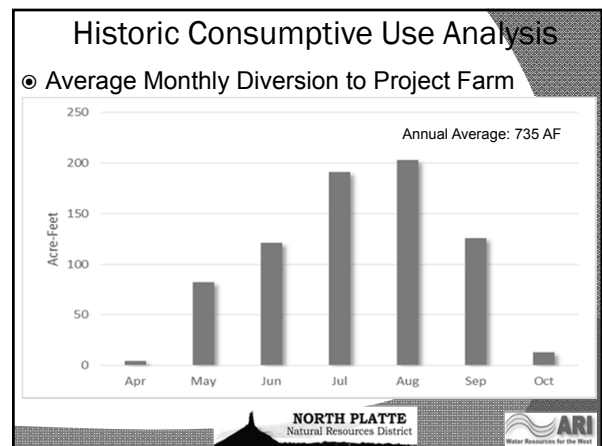
Total Ditch Supply from River  $-$  Average Canal Loss (40%)  $\times$  326 Farm Acres  $=$  1,706 Total ID Acres

Farm Turnout Supply  $\times$  Average Irrigation Efficiency (77%)  $=$  Water Supply Available to Crops

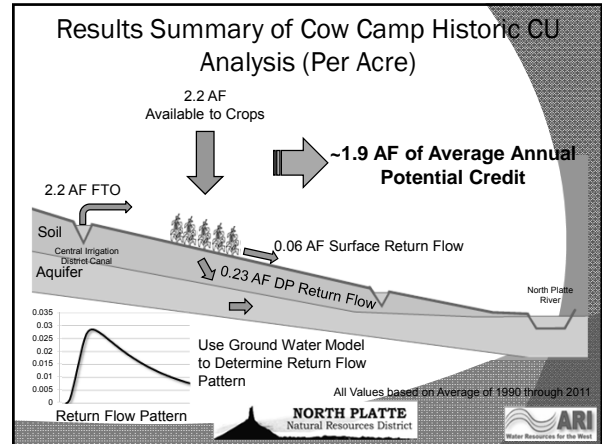
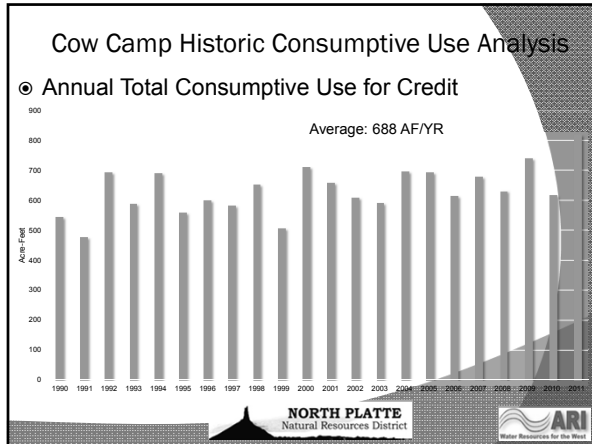
### Historic CU Analysis Method Total Return Flow Calculation

**Total Return Flows**  $=$  Canal Losses  $+$  Tail Water from Farm Fields (Returns to river same month diverted)  $+$  Deep Percolation from Inefficiency of Irrigation Over Application of Water Supply Available to Crops

### Historic CU Analysis Method Deep Percolation Return Flow to the North Platte River



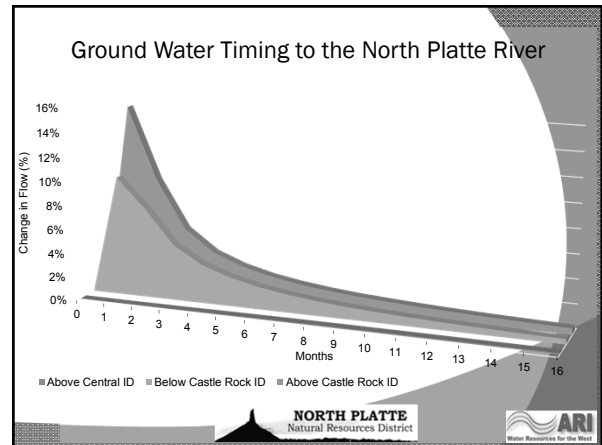




### Cow Camp Aquifer Tests

- Test two existing irrigation wells
- Determine aquifer properties
- Locally refine ground water model with site specific information

NORTH PLATTE Natural Resources District  
 ARI Water Resources for the West



### Cost Benefit Analysis for Cow Camp Project

- 350.7 acres leased
- \$325/acre/year
- 688 acre-feet/year average potential credit
  - 3,440 acre-feet of water credit over the 5 year lease
- \$166 per acre-foot of average annual potential credit for the 5 year lease

Note: All costs do not include legal, engineering, construction, and accounting fees.

NORTH PLATTE Natural Resources District  
 ARI Water Resources for the West

### Cow Camp Options for Delivery of Credit to the North Platte River

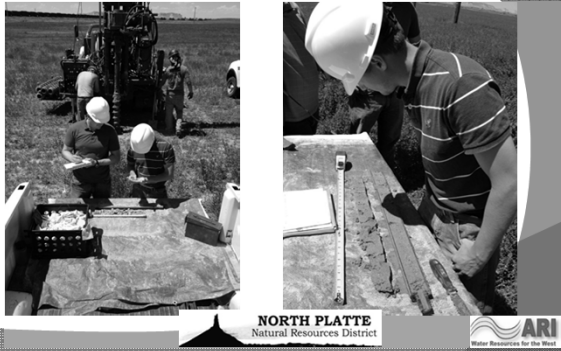
- Recharge of water into recharge pits for later discharge to the North Platte River

AND/OR

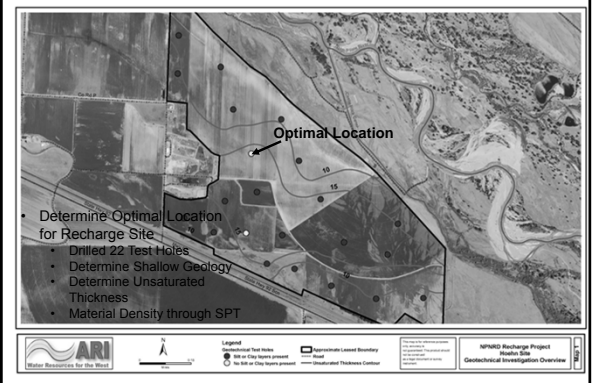
- Direct delivery to the North Platte River
- Protection of 3<sup>rd</sup> parties will be maintained including parties that rely on wintertime flow for storage

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### Geotechnical Survey Sampling for Recharge Pit



### Determination of Optimal Location for Recharge Pit for Cow Camp Project



### Cow Camp Next Steps

- Update and finalize supporting document for permit application to NDNR
  - Submit amended permit application package to NDNR
  - Landowner would like to renew lease
- NORTH PLATTE**  
Natural Resources District
- ARI**  
Water Resources for the West

### Rush/Rogers Surface Water Project

- Total farm is ~65 acres
  - Located on Enterprise Canal
  - In process of completing historic consumptive use analysis and documentation for NDNR permit applications
- NORTH PLATTE**  
Natural Resources District
- ARI**  
Water Resources for the West

Thanks!

- Questions
  - Comments
- NORTH PLATTE**  
Natural Resources District
- ARI**  
Water Resources for the West

# 2<sup>ND</sup> INCREMENT

# UPPER PLATTE BASIN-WIDE IMP

Second Increment Planning for Stakeholder Involvement

| June 18 <sup>th</sup><br>2015   | August 21 <sup>st</sup><br>2015  | Fall 2015   | Winter 2015  | 2016                       | Late 2019                               |
|---|--|---|--|----------------------------|---|
| Planning begins for 2 <sup>nd</sup> increment stakeholder involvement | <u>Meeting 1:</u><br>Participants discuss state of basin and desired stakeholder process | <u>Meeting 2:</u><br>Participants follow-up on state of basin and desired stakeholder process | <u>Meeting 3:</u><br>participants meet to define features and schedule of planning process | Stakeholder process begins | 2 <sup>nd</sup> increment IMP completed |