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TBNRD IMP

2nd Increment IMP
Stakeholder Meeting #2
December 12, 2018

Tri Basin Natural Resources District

NEBRASKA DEPT. OF NATURAL RESOURCES

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TODAY'S AGENDA

- Welcome
- Upper Platte Basin-Wide Plan
  - Status Update
  - 2nd Increment Topics
    - Conjunctive Management
    - Municipal Statute – 2026 Offsets
    - Drought Planning
- Robust Review Results
- Stakeholder Discussion
- Next Steps
- Public Comment

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WELCOME

- Open meeting notice
- Safety & logistics
- Introductions

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UPPER PLATTE BASIN-WIDE PLAN STATUS UPDATE

Goals & Objectives

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Basin-wide Plan Goals and Objectives (Draft)

Goals

1. Incrementally achieve and sustain a fully appropriated condition, while maintaining economic viability, social and environment health, safety, and welfare of the basin
2. Prevent or mitigate human-induced reductions in the flow of a river of stream that would cause non-compliance with an interstate compact or decree or other formal state contract or agreement
3. Partner with municipalities and industries to maximize conservation and water use efficiency
4. Work cooperatively to identify and investigate disputes between groundwater users and surface water appropriators and, if determined appropriate, implement management solutions to address such issues
5. Keep the Upper Platte River Basin-Wide Plan current and keep stakeholders informed

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Goal 1: **Incrementally achieve and sustain a fully appropriated condition**, while maintaining **economic viability**, **social and environment health, safety, and welfare of the basin**

1.1 Maintain **previous increment mitigation** progress

1.2 **Offset impacts of streamflow depletion** to (A) surface water appropriations and (B) water wells constructed in aquifers dependent on recharge from streamflow **to the extent those depletions are due to water use initiated after July 1, 1997**

1.3 **Make progress toward a fully appropriated condition**

1.4 **Conduct technical analyses** to support and evaluate effectiveness of plan and adequacy in sustaining progress toward a fully appropriated level of water use

1.5 **Use available funds and actively pursue new funding opportunities** to cost effectively offset depletions, as well as to develop, maintain and update data and analytical tools needed to implement this plan

1.6 **Update and continue implementing IMPs** in each Platte River Basin NRD

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Goal 1: **Incrementally achieve and sustain a fully appropriated condition**, while maintaining **economic viability**, **social and environment health, safety, and welfare of the basin**

1.3 Make progress toward a fully appropriated condition

- 1.3.1: Understand the economic impacts of supply variability on water users
- 1.3.2: Assess short- and long- term basin water supply and demand
- 1.3.3: Explore and implement potential measures to mitigate impacts (hydrologic and economic) of basin supply variability due to human-made depletions on surface water and groundwater users
- 1.3.4: Develop a basin drought contingency plan for management of supplies during times of shortage

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Goal 2: **Prevent or mitigate human-induced reductions** in the flow of a river or stream **that would cause non-compliance** with an interstate compact or decree or other formal state contract or agreement

2.1 Prevent human-induced streamflow depletions that would cause non-compliance by Nebraska with the Nebraska New Depletion Plan included within the Platte River Recovery Implementation Program, for as long as the Program exists

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Goal 3: **Partner with municipalities and industries to maximize conservation and water use efficiency**

3.1 Continue to **collect data on water use and existing conservation plans** of municipalities and industries within the basin

3.2 Invite municipalities and industries to the **annual meetings**

3.3 **Establish baseline water use levels** for each municipal and industrial user by **January 1, 2026**

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Goal 4: Work cooperatively to **identify and investigate disputes between groundwater users and surface water appropriators** and, if determined appropriate, implement management solutions to address such issues

4.1 **Identify disputes** between groundwater users and surface water appropriators

4.2 **Investigate and address issues** between groundwater users and surface water appropriators, based on investigation results

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Goal 5: **Keep the Upper Platte River Basin-Wide Plan current and keep stakeholders informed**

5.1 **Meet at least annually** to review progress toward achieving the goals and objectives of this Upper Platte River Basin-Wide Plan and those portions of the individual NRD IMPs that implement this plan

5.2 **Improve information sharing** with interested stakeholders

5.3 **Conduct planning for subsequent increments** of the plan, as necessary

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2ND INCREMENT TOPICS

CONJUNCTIVE MANAGEMENT

IN THE UPPER PLATTE RIVER BASIN

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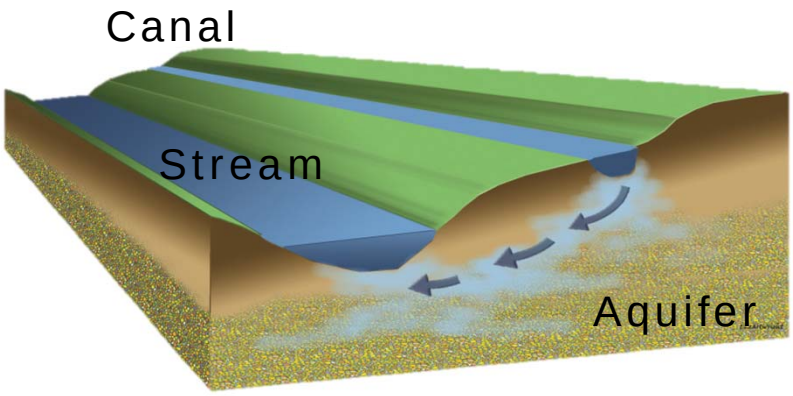
UNDERLYING CONCEPTS OF CONJUNCTIVE WATER MANAGEMENT

(CWM)

- Surface and groundwater resources are interconnected
- Decisions to improve the management of one cannot be made properly without considering the other



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Conjunctive Water Management is an adaptive process that utilizes the connection between surface water and groundwater to increase sustainability of both water sources, by increasing the overall water supply of a region.

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HOW IS CWM ACCOMPLISHED?

- Typically, by:
  - Using or storing additional surface water when it is plentiful
  - Relying more heavily on groundwater during dry periods
- Can change the timing and location of water for more efficient use

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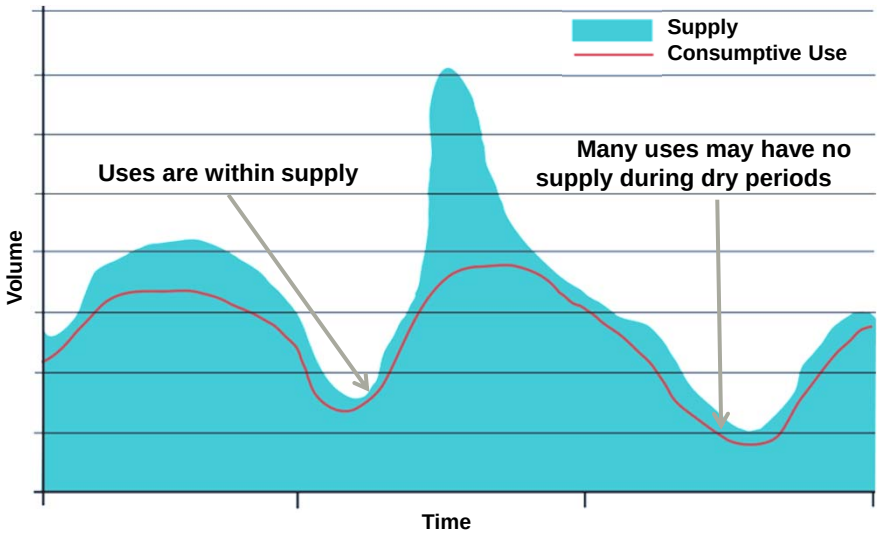
SCENARIO 1:

USING SURFACE WATER ONLY



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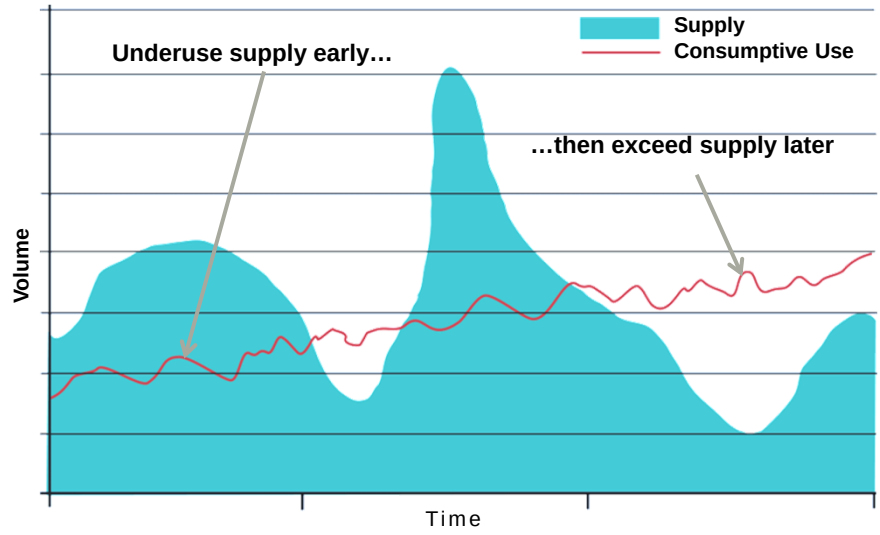
SCENARIO 2:

USING GROUNDWATER ONLY



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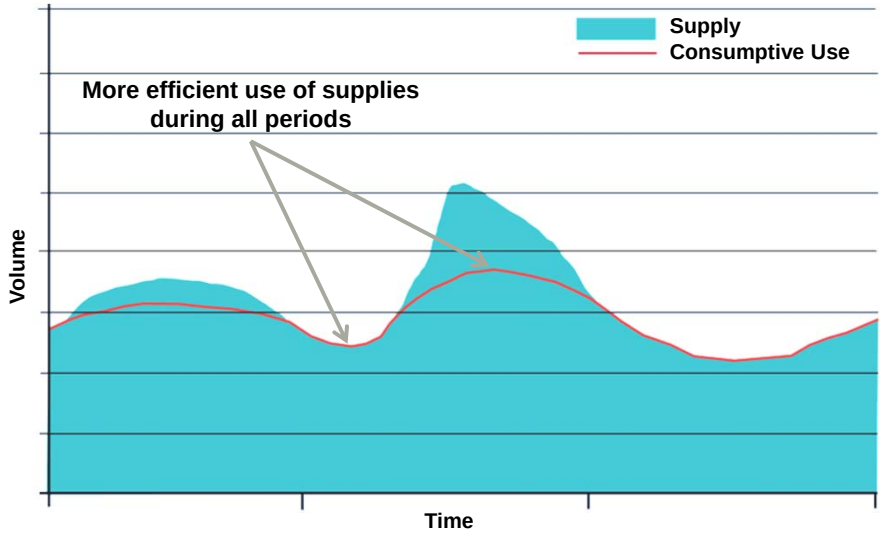
SCENARIO 3:

MANAGING SUPPLIES THROUGH CWM



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COMPONENTS OF CWM

- Surface water diversion and groundwater pumping
- Aquifer recharge
- Management of the timing of return flows
- Program for monitoring and evaluation

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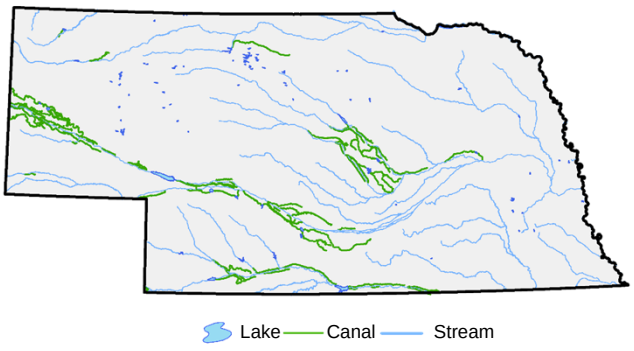
BENEFITS OF CWM

- Maximize available water supplies
- Leverage existing infrastructure
- Use existing planning framework
- Minimize the need for regulatory actions
- Customize to local opportunities or needs
- Maintain viability of existing uses



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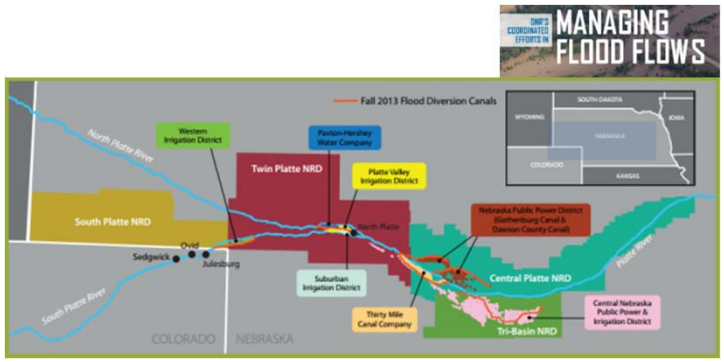
EXAMPLES OF CWM PROJECTS

- Augmentation projects such as N-CORPE
- Western canal conjunctive management study
- Water leasing arrangements
- CPNRD transfers and canal refurbishment
- Capturing excess flows using existing canal infrastructure (in partnership with irrigation districts)



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APPLYING CONJUNCTIVE MANAGEMENT

IN THE UPPER PLATTE RIVER BASIN

First Increment CWM Activities

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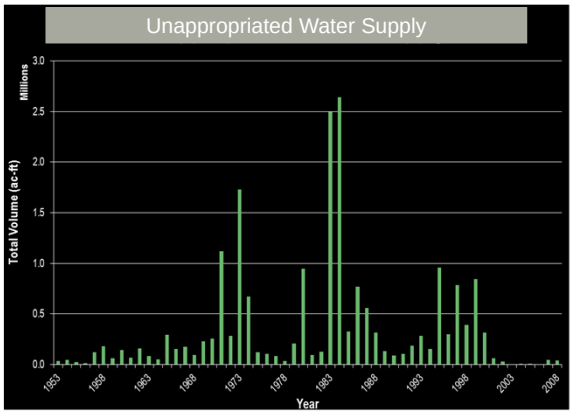
UPPER PLATTE RIVER WATER SUPPLIES

- Receives average of 1 million ac-ft from snowmelt in Wyoming each year (North Platte Decree)
- More variable inflows in South Platte from Colorado
- Water is generally fully allocated, particularly above Elm Creek (over appropriated)
- Streamflow required to be shared under Endangered Species Act (Federal)
- Unappropriated water does occur during some very wet years, during shorter intervals, and outside of the irrigation season



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2011 PILOT PROJECT

- High flows in spring prior to irrigation season
- NeDNR coordinated with NRDs, Irrigation Districts/Canal Companies to divert excesses
- Acquisition of permits
- Contracts
- Monitor

Slide 23

MM1 Would like to reformat this an maybe a few other charts if we have time.
Mosier, Melissa, 3/12/2018

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2013 FLOOD FLOWS

Friday, September 20, 2013

Saturday, September 21, 2013

South Platte River Highway 83 Bridge, North Platte, NE

South Platte River Buffalo Bill Road Bridge, North Platte, NE

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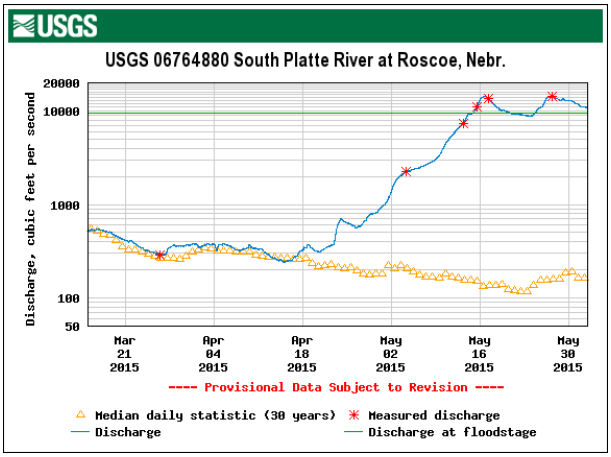
2015 FLOOD FLOWS

- Wet conditions during above average spring snowmelt
- Canals filled early
- Stored excess in lakes, reservoirs

30-Mile Canal Headworks,
June 2015



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Flood & Excess Flow Benefits

E65 Canal
Elwood Canal
Phelps Canal

Year	Diversion	Recharge
2011	2,800	2,800
2013	17,500	17,500
2014	24,000	*Analysis in progress*
2015	13,400	*Analysis in progress*
2016	4,200	*Analysis in progress*

All values in acre-feet/year

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CWM FUTURE ACTIVITIES

- Expand implementation of CWM projects
- Enhance adaptation strategies based on management goals
- Support continued investment in maintaining and enhancing infrastructure
- Ensure that sound science and monitoring are available to support management decisions

Cozad Canal, Gothenburg, NE

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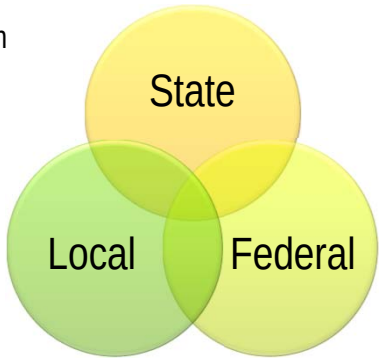
Collaboration

- Essential for Success
- State Agency
- Individual Canals
- Platte River Recovery Implementation Program
- States of Wyoming & Colorado



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2ND INCREMENT TOPICS

MUNICIPAL STATUTE – 2026 OFFSETS

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NEBRASKA REVISED STATUTE 46-740

- January 1, 2026 = Changes required by municipal and industrial statute
  - Responsibility for offsetting municipal growth?
    - Municipality
    - NRD
  - Responsibility for offsetting industrial growth?
    - Industry
    - NRD

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2ND INCREMENT TOPICS
DROUGHT PLANNING

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Stakeholder Feedback

- What problems do you face in drought?
- What important components should be included in a drought plan?
- Would you be interested in participating in a drought workshop?

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2ND INCREMENT TOPICS
ROBUST REVIEW RESULTS

Robust Review Analysis

TBNRD Results

TBNRD IMP Stakeholder Meeting #2
December 12, 2018

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Robust Review Goals

- **Complete monitoring activities outlined in the current IMP**
- **Assess progress on first increment goals and objectives**
- **Provide for more informed discussion of second increment objectives with the TBNRD IMP stakeholders**

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Robust Review Model Simulation Setup

COHYST Area Assumptions

- Used version 28 of the groundwater model and version 29 of the watershed models
- Models are simulated from 1950 – 2063
- Climate repeats 1989-2013 twice for 2014-2063
- Historical groundwater irrigated acres and crops are used in the baseline simulation and the 1997 level of groundwater irrigated acres and crops are used in the "1997" simulation
- Surface water and commingled acres remain constant in the baseline and 1997 simulations to cancel out commingled effects
- Results are summarized for the: 1) area upstream of Elm Creek (OA), and 2) area between Elm Creek and Chapman

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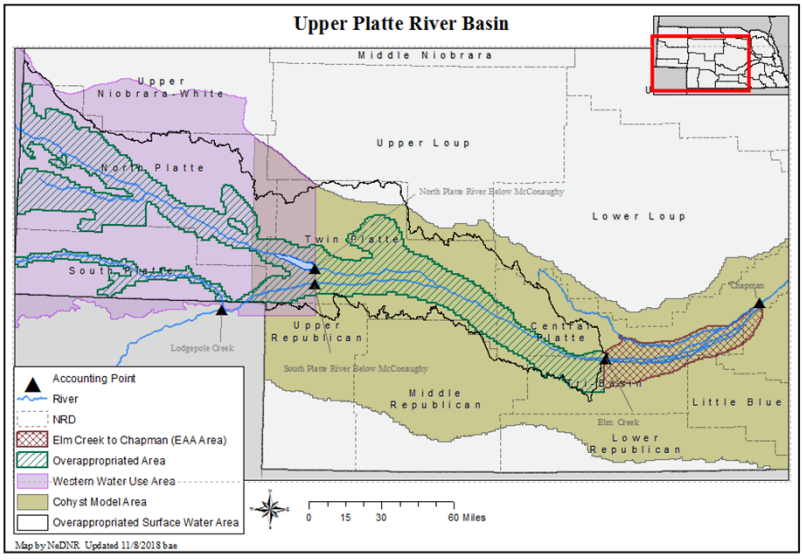
Model Areas



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TBNRD - Inputs
(Change in acres)

Change in groundwater-only irrigated acres 1997-2013

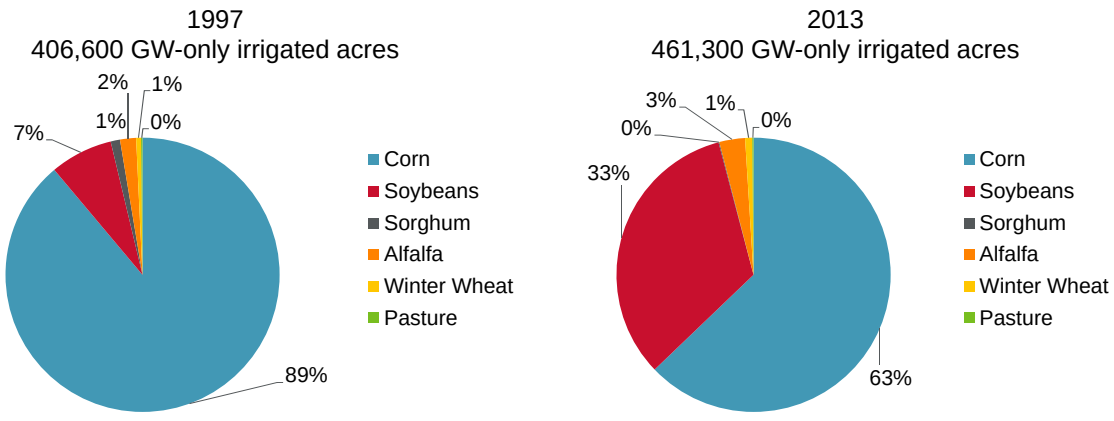
TBNRD	Total change (1997 to 2013)
District-Wide	**54,700 acre increase**
TBNRD OA*	**7,000 acre increase**

*Total change in OA acres included in total change in District-wide acres

TBNRD - Inputs

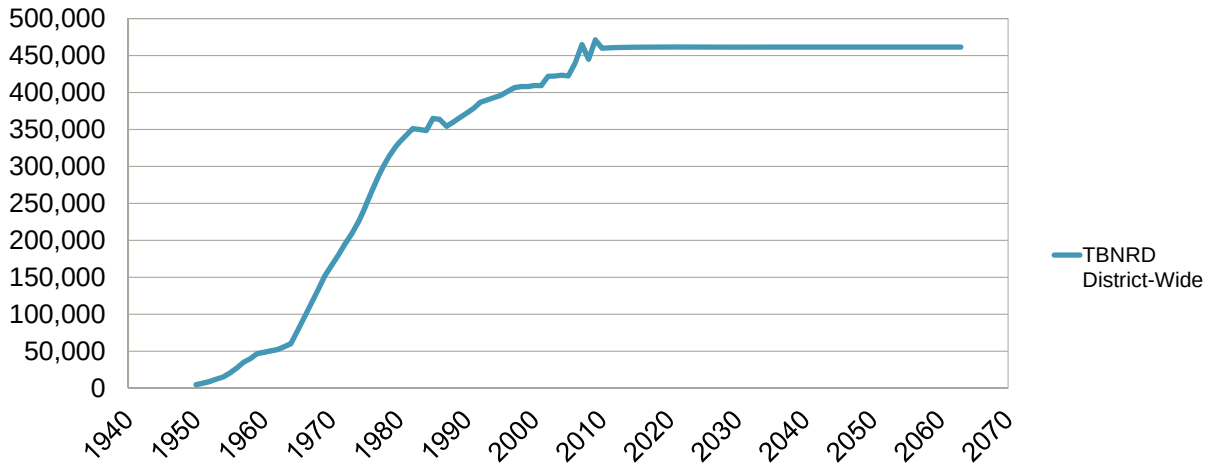
Changes in crop type in Platte Basin portion of TBNRD

Groundwater-only irrigated acre crop types 1997-2013



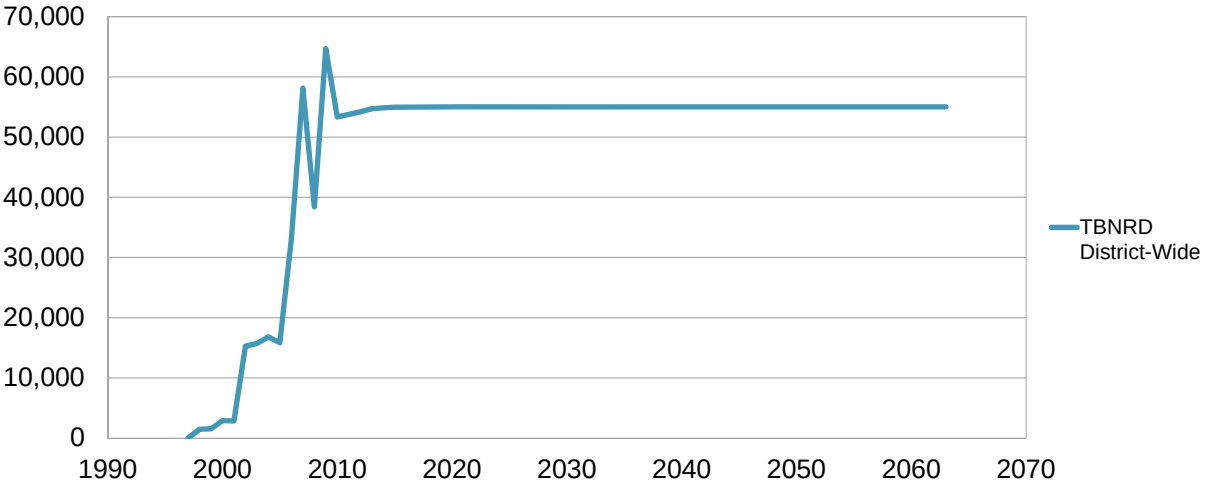
TBNRD - Inputs

Change in groundwater-only irrigated acres



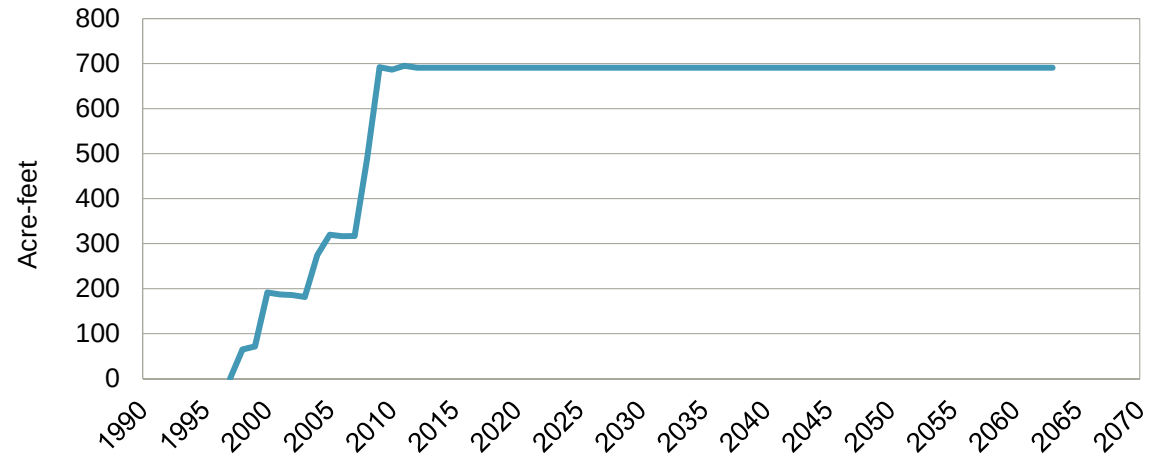
TBNRD - Inputs

Change in post-1997 groundwater-only irrigated acres



TBNRD - Inputs

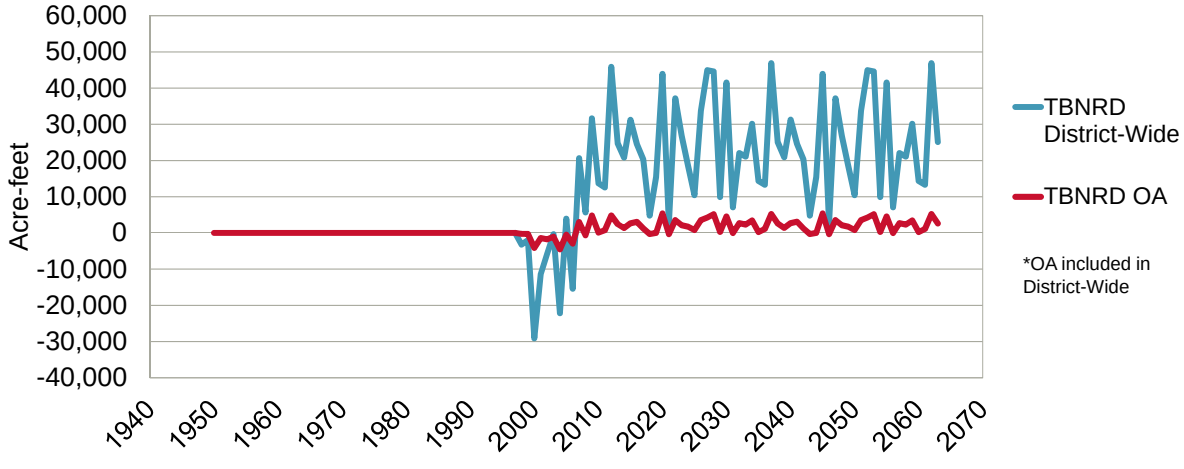
Change in municipal and industrial pumping from 1997, District-wide



TBNRD - Inputs

Pumping changes compared to 1997

Groundwater-only irrigation pumping

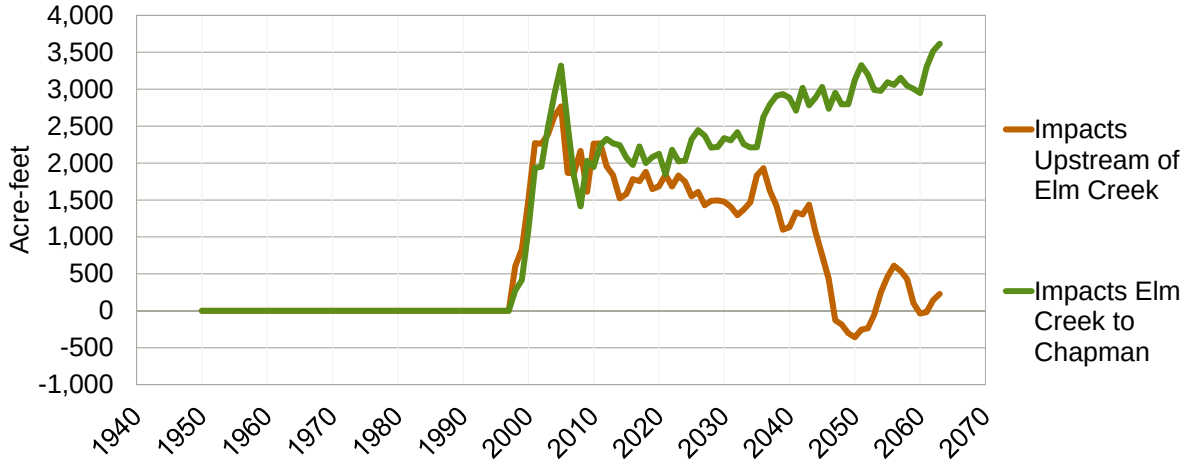


TBNRD Results

Positive values = accretions to the stream
Negative values = depletions to the stream

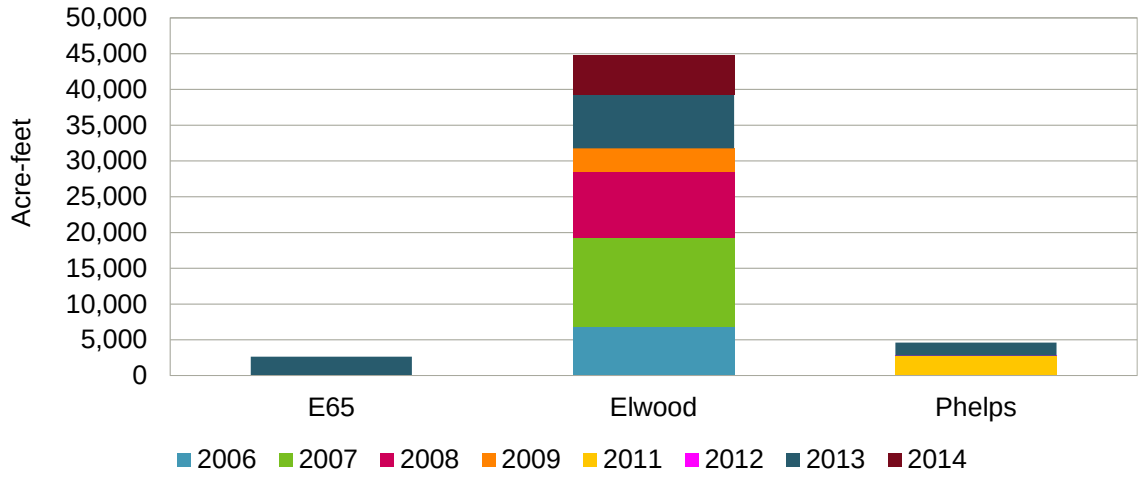
Impact from District-Wide changes in groundwater pumping

Groundwater-only irrigation pumping & municipal/industrial pumping



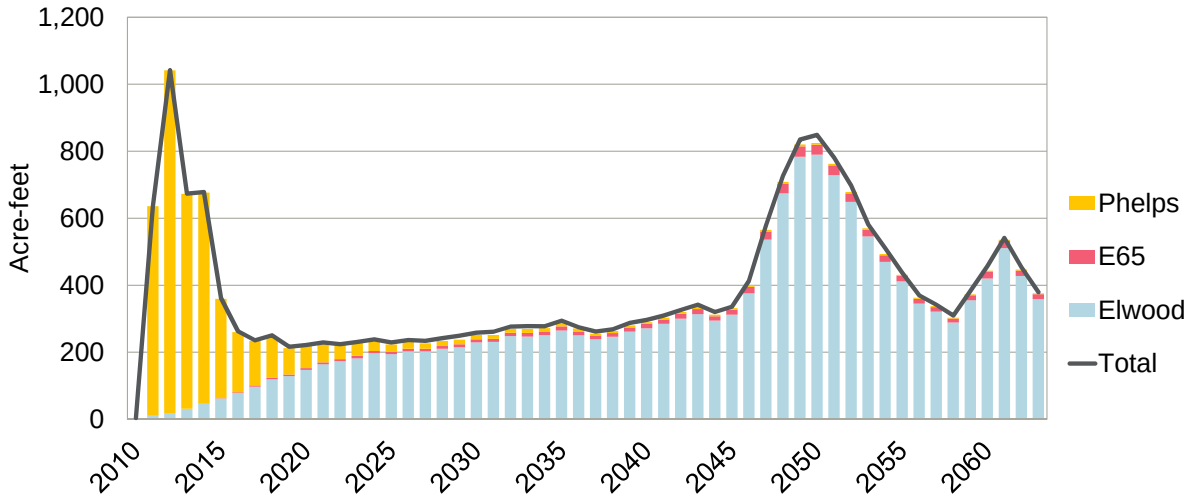
TBNRD - Inputs

Recharge from excess flow projects



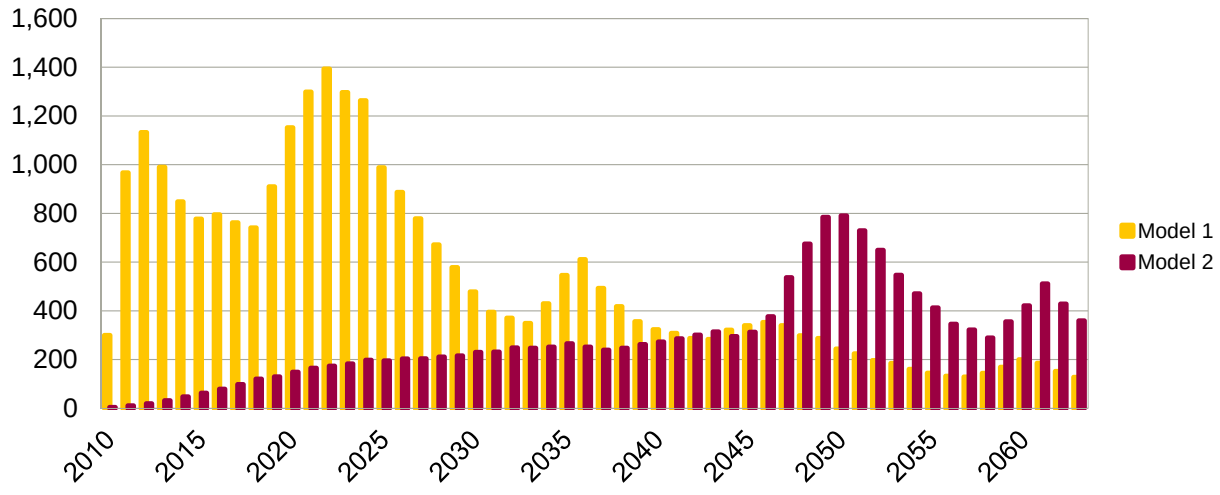
TBNRD - Inputs

Accretions from excess flow projects upstream of Elm Creek



TBNRD - Inputs

Elwood accretions comparison – Summary of different model assumptions



TBNRD - Inputs

Positive values = accretions to the stream
Negative values = depletions to the stream

Pumping & impacts from North Dry Creek augmentation project (2011, 2012 & 2013)

Augmentation pumping, depletions, and net impact

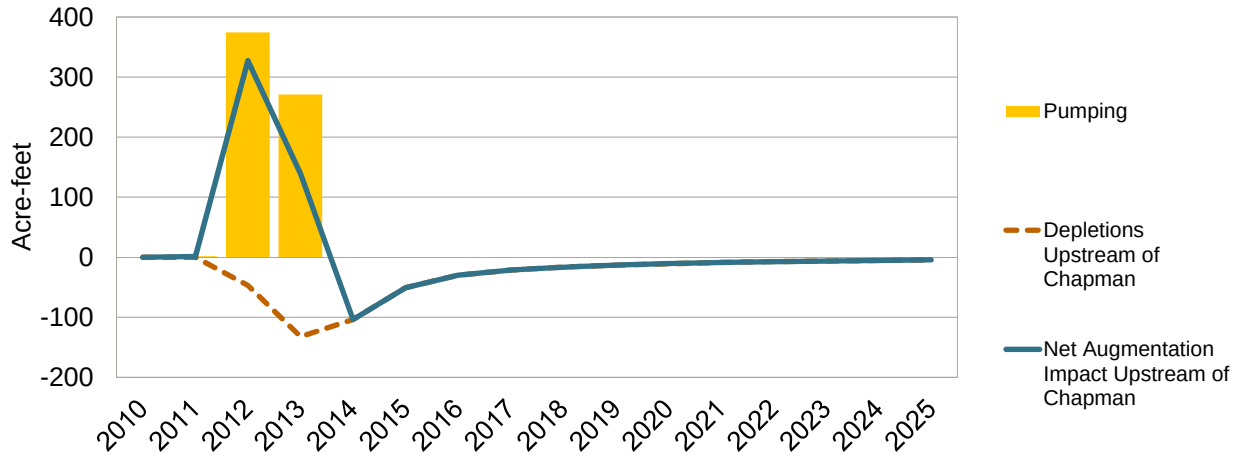
Total pumping	647 acre-feet
Total depletions (upstream of Chapman)	-517 acre-feet
Net augmentation impact (upstream of Chapman)	130 acre-feet

TBNRD - Inputs

Positive values = accretions to the stream
Negative values = depletions to the stream

Pumping & impacts from North Dry Creek augmentation project (2011, 2012 & 2013)

Augmentation pumping, depletions, and net impact

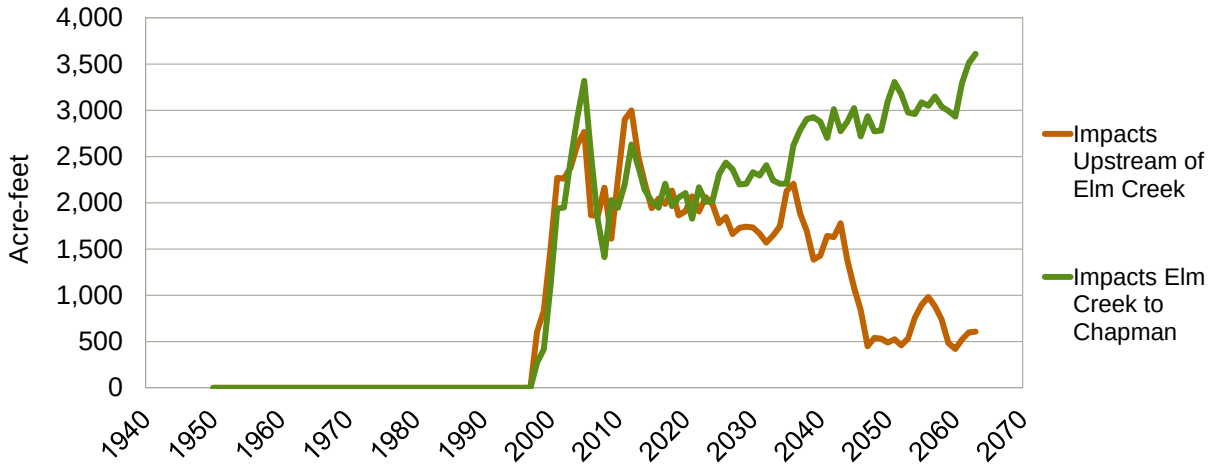


TBNRD Results

Positive values = accretions to the stream
Negative values = depletions to the stream

Impacts from District-Wide activities

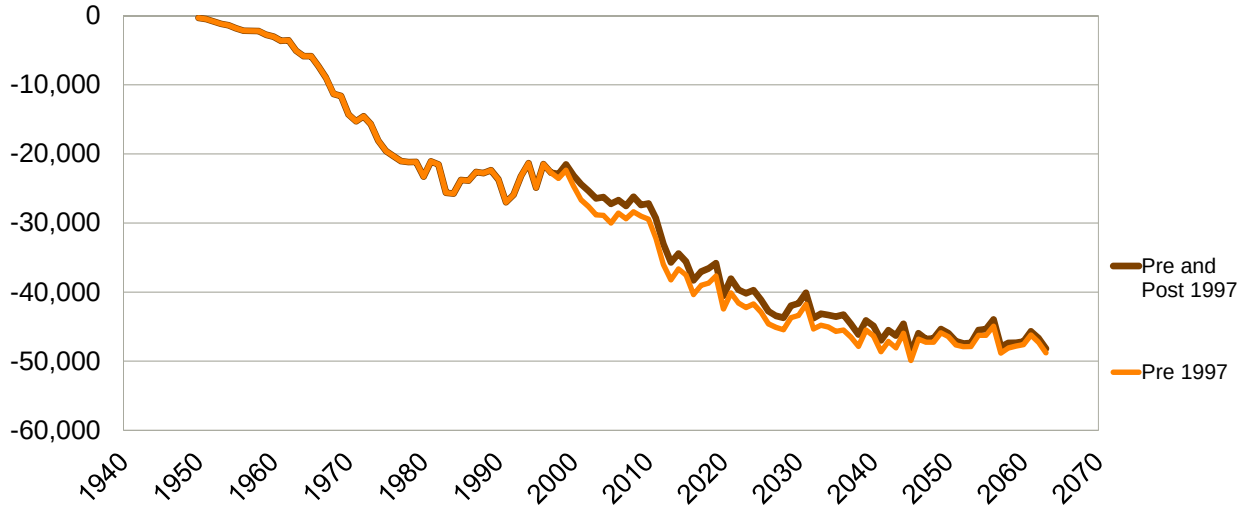
Groundwater-only irrigation and M&I pumping, retirements, recharge projects, and net augmentation



TBNRD Results

Positive values = accretions to the stream
Negative values = depletions to the stream

All groundwater-only and M&I (total) depletions to the TBNRD Upstream of Elm Creek



TBNRD Summary

Post-1997 impacts from District-Wide activities

Includes groundwater-only irrigation pumping, municipal & industrial pumping, impacts from augmentation and excess flow projects.

Year	2019	2019	2029	2029
Stream segment	Upstream of Elm Creek (OA)	Elm Creek to Chapman	Upstream of Elm Creek (OA)	Elm Creek to Chapman
Impact (a/f)	1,900	2,100	1,700	2,200

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2ND INCREMENT TOPICS

STAKEHOLDER DISCUSSION

What's missing?

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2ND INCREMENT TOPICS
NEXT STEPS

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Next steps

- Next IMP stakeholder meeting
  - February 13, 2019 at 1:00 pm, TBNRD Office
- Upper Platte Basin-Wide Plan - Public information meeting
  - April 18, 2019, North Platte Holiday Inn Express
- Hearings on Upper Platte Basin-Wide Plan and TBNRD IMP
  - July 16, 2019, TBNRD Office

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2ND INCREMENT TOPICS

PUBLIC COMMENT

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