NEBRASKA’S WATER MANAGEMENT RESOURCE

Providing the sound science and support for managing Nebraska’s most precious resource.

INTEGRATED WATER MANAGEMENT PLANNING PROCESS AND THE LPSNRD VOLUNTARY IMP

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Lower Platte South Natural Resources District
Providing the sound science and support for managing Nebraska’s most precious resource.
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Overview

Integrated Management Plans (IMPs)

Voluntary IMPs and the IMP Process

Implementation Example: Flood Diversions

LPSNRD IMP
INTEGRATED MANAGEMENT PLANNING OVERVIEW

An IMP is a proactive, collaborative approach to managing hydrologically connected surface and groundwater.
Water Planning in Nebraska

WATER QUALITY

WATER QUANTITY

SURFACE WATER

GROUNDWATER

DNR

NRD

IMPs

AG

HHS

DEQ

Nebraska Department of Natural Resources
Integrated Water Management

IMPLEMENTATION
- Water Management Projects
- Strategic Planning Actions

PLANNING AND PUBLIC PARTICIPATION
- Goals and Objectives for Water Planning
- Stakeholder Involvement

SCIENCE
- Water Availability and Water Shortages
- Water Supplies and Water Uses
- Hydrologic Models, Data, and Analyses
Integrated Management Planning: What is it?

- Surface water and groundwater management
- Proactive
- Protects existing investments
- Adaptive management
- Jointly developed with NRD
- Suited to local conditions
Integrated Management Planning is a Collaborative Process

- DNR + a Natural Resources District (NRD)
  - IMP development
  - Plan implementation

- Stakeholder input

![IMP Areas Map](image)
Core Goals of Water Supply Planning

ECONOMIC VIABILITY

AQUIFER

STREAMFLOW

Nebraska Department of Natural Resources
VOLUNTARY IMPS AND THE PLANNING PROCESS
Voluntary IMPs

- **LB962 (2004)**
  - IMP required if fully or overappropriated
  - No mechanism for voluntary IMPs

- **LB764 (2010)**
  - Authorized voluntary IMPs

- **LB1098 (2014)**
  - Water Sustainability Fund
IMP Development Process

**DNR/NRD Collaboration**
- Initiate IMP Process
- Develop Goals & Objectives
- Develop Action Items
- Draft IMP
- Reach consensus
- Decide whether to adopt and implement the plan

**Public Involvement**
- Consult with stakeholders
- Continue to engage stakeholders
- Hold Public Hearings
IMP Implementation

- Action Items
- Monitoring Program
  - Tracking action items in context of achieving goals & objectives
- Evaluation
  - Are action items achieving desired goals?
  - Are water supply and demand changing?
  - Have goals changed?
  - Has fully appropriated status changed?
- Adaptive Management
IMPLEMENTATION EXAMPLE

Partnerships formed through the IMP process facilitated diversion of Platte River floodwaters for recharge
Implementation Example:
Using Excess Flows for Recharge
Flooding Begins in Colorado

- Week long precipitation event September 9-16, 2013
- Stream gages washed away from CO bridges
- Unknown floodwaters headed to NE
Precipitation Total in Colorado

A Google Map with information from Boulder National Weather Service Forecast office.
Department Preparation

Peak flow in CO determined by Bridgeport Field Office

Roscoe, Nebraska
Department Preparation
Potential Flood Inundation Depth Map
Peak Discharges of South Platte and Platte Rivers

Ft. Morgan - NP (182 mi, 7.2 days)
NP - Duncan (200 mi, 12.1 days)

Source: Platte River Recovery and Implementation Program

Source: Platte River Recovery and Implementation Program

Department of Natural Resources
Department Preparation

Work with Irrigation Districts to Divert Floodwaters for Recharging the Aquifer
Flood Flow Diversion Management

- Collaborative effort
- Contact potential partners to divert floodwaters
  - Canals
  - Irrigation Districts
- Agreements developed quickly with partners
- Coordinated timing of diversions
- Potential to provide beneficial recharge
Diversions of Fall 2013 Floodwaters

- Total Diverted (9/15 to 10/31/2013): 44,100 AF
- Total Recharged (Estimated): 29,900 AF
- Total Cost: $707,748
- Cost per Acre-foot: $24
Before the Flood Event & 26 Hours Later

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

South Platte River Bridge, Highway 83, North Platte, Nebraska
Saturday, September 21, 2013, at 11:00 a.m.
VOLUNTARY IMP FOR THE LOWER PLATTE SOUTH NRD

Prepared jointly by the District and the Department
Ground Water Available

Ground Water Reservoirs (4,000,000 Acre-Feet)
Lower Platte South NRD

- **DV**: 35%
- **Remaining**: 17%
- **PR**: 3%
- **MR**: 4%
- **LSC**: 4%
- **CPA**: 37%

Crete-Princeton-Adams, 1.5M AF; Dwight-Valparaiso, 1.4M AF; Remaining Area, 698,000 AF; Lower Salt Creek, 170,000 AF; Missouri River, 150,000 AF; and Platte River, 100,000 AF.
Lower Platte River Basin
<table>
<thead>
<tr>
<th></th>
<th>Amount (KAF)</th>
<th>Period of Assessment</th>
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</thead>
<tbody>
<tr>
<td><strong>Inflows</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precipitation</td>
<td>2,729</td>
<td>1980-2010</td>
</tr>
<tr>
<td>Surface water inflow</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Subsurface inflows</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Imported Water</td>
<td>40</td>
<td>1988-2010</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,769</td>
<td></td>
</tr>
<tr>
<td><strong>Outflows</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td>2,220</td>
<td>1980-2010 (based on 2005 land use)</td>
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<tr>
<td>Surface water outflow</td>
<td>395</td>
<td>1980-2010</td>
</tr>
<tr>
<td>Minor tributary outflow</td>
<td>124</td>
<td>1980-2010</td>
</tr>
<tr>
<td>Subsurface outflow</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,739</td>
<td></td>
</tr>
<tr>
<td><strong>Change in Storage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundwater storage</td>
<td>-4</td>
<td>2000-2010</td>
</tr>
<tr>
<td>Surface water storage</td>
<td>-1</td>
<td>1993-2010</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-5</td>
<td></td>
</tr>
<tr>
<td><strong>Remainder</strong></td>
<td>35</td>
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What Were We Thinking??

- Proactive philosophy of Board
- Voluntary IMP was action item in LRIP in 2006
- Fully appropriated designation reversed in 2008, BUT....
- Bottom of the LPR Basin and destiny & responsibilities if fully appropriated
- Law didn’t allow so lets change the law in 2010
- Notified NDNR of intent on Nov. 17 2010
What Were We Thinking?

- Board retreat in early 2011
- Stakeholder Perspective Survey
- Water Balance Study
- Contracted HDR to implement Public Involvement Plan
- 18 month plan development
- Effective date of Plan is May 14, 2014.
Who is Involved & What is Their Goal?

- **IMP Subcommittee**
  - Responsible for overseeing the planning process and to meet statutory requirements. The Subcommittee’s charge is to recommend an IMP for adoption by the LPSNRD Board of Directors and DNR.

- **Stakeholder Advisory Committee**
  - Ensures the planning process meets the goal of the Public Involvement Plan, provides a broad set of perspectives to ensure the IMP reflects diverse water management needs, makes recommendations to assist LPSNRD in meeting mandated requirements, engages stakeholders and encourages participation at public events.

- **DNR**
  - A partner in the development of the IMP and the planning process. The DNR’s role is to collaborate in carrying out the actions of the IMP.

- **Agency Input/Public Input**
  - Throughout the process, both the general public and agencies in the District with water interests have been encouraged to participate and provide input regarding water uses, needs, demands, and future management for consideration by the IMP Subcommittee.

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**The Integrated Management Plan will:**

- Develop a comprehensive inventory of all available ground and surface water supplies and all current water uses.
- Help to project future water needs.
- Identify potential sources and desired management and conservation programs.
Public Involvement Process

➢ Comprehensive Public Involvement from start to adoption of Plan.

➢ Components:
  o Stakeholder Advisory Group (20 members)
  o Four Focus Groups
  o Agency coordination meetings
  o Virtual Town Hall meetings
  o Public Open House Prioritization Workshop
  o Social Media and Website
Vision

“Water uses and water supplies are in a managed balance, supporting economic viability, environmental sustainability and safe living conditions.”

The plan will be instrumental in identifying available water supplies and managing water quantity to meet the future water needs in the District.
Integrated Management Plan Goals

**Water Inventory**
Water Inventory includes the inflow, precipitation, and water storage available to the District along with the water use and outflows from the District.

**Goal:** Ensure the District has sufficient data to enable the achievement of a water supply that is in balance with current and future water demands in the District.

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**Water Supply Management**
Water Supply Management is the management of water supply, both in and out of the District, through human efforts.

**Goal:** Ensure a sustainable water supply is available in the amounts and location of the demands through management actions to meet the District’s short and long term needs.

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**Water Use Management**
Water Use Management is the management of how water is used and consumed while meeting current and future demands.

**Goal:** Encourage all water users to minimize water use while optimizing benefits.
Water Inventory

- Comprehensive inventory of water supplies, uses and outflows
  - Study aquifers and connectivity to surface water
  - Estimate water use from unmetered wells
  - Estimate consumptive water uses
- Evaluate variations due to climate trends
- Study basin-wide inflows /outflows
- Project changes due to urban and rural growth
- Evaluate sources and effects of additional supplies
- Study extent of hydrologically connected waters
Water Supply Management

- Optimize location and design of wells for aquifer characteristics
  - Identify areas of potential conflicts

- Research & implement additional supply and storage opportunities within District
  - Integrated surface & ground water storage
  - Regional and collaborative domestic water supply & distribution systems
  - Collaborate on proactive water management, including dry year leasing
Water Supply Management

- Evaluate feasibility and benefits of water reuse
  - Rain barrels, stormwater and wastewater reuse
- Monitor impacts of vegetative growth on streamflows
- Collaborate in studies and planning to identify additional / regional water supplies outside the District
Water Use Management

- Determine best available irrigation technologies
  - Support BMPs, education, alternate crops, cover crops, technology innovations
  - Estimate future demands & consumptive uses
- Determine best available industrial technologies & practices
- Determine best applications of native & low water use landscapes
- Determine best indoor water conservation practices
Water Use Management

- Determine best water conservation programs, rates, & meters for all public water systems
- Evaluate benefits of greywater reuse, rainwater & stormwater harvesting & reuse, & reuse of irrigation water
  - Model sample watersheds for + and – impacts
  - Technology, support, & pilot projects
- Evaluate instream flow needs and benefits in the District
Water Use Management

- Manage expansion of new water uses so as not to adversely affect current users.
  - Develop thresholds for use expansion
  - Monitor changes in water use and land use
  - Effective communications with public water systems

- Expand education programs on water supplies and conservation measures

- Consider fees or incentives that encourage water conservation.
2014 Annual Report

- Includes the actions and progress made towards IMP action by the LPSNRD and NDNR in 2014.
  - Data collected, ground and surface water permits, and changes in uses
  - Action items accomplished and progress towards goals and objectives
  - Future action steps for 2015 and 2016
  - Potential modifications to the IMP
2014 ACTIONS & PROGRESS

- Monitoring and data collection
  - 14 streamflow gages
  - Surface water appropriation permits (4 new; 15 cancelled; voluntary water use reporting)
  - Ground water (29 well permits/19 completed; water level monitoring in 139 wells, spring & fall with avg. declines of 1.12 feet; meters and water use reporting from 393 wells of 5.5+ M gals.)
2014 Actions & Progress

➢ Monitoring and data collection (continued)
  o Certified irrigated acres (HCA +48 to 3,172 acres; Remainder +1,636 to 23,058 acres)
  o Ground water rules variances (6 approved; one denied)
  o Water Banking / Transfers (no activity)
2014 Actions & Progress

➢ Moratoriums:
  o Ground Water
    ▪ HCA limitation on increasing irrigated acres
    ▪ DVB Special Management Area designated and moratorium lifted except for increasing irrigated acres
  o Surface Water
    ▪ HCA limitation on increasing irrigated acres

➢ Ground Water Allocations
  ▪ DVB SMA at 21 in/3 yrs/ac, not to exceed 9 in/yr for sprinkler irrigation and 30 in/3 yrs/ac, not to exceed 12 in/yr for gravity irrigation.
2014 Actions & Progress

➢ Non-regulatory:
  o Interagency coordination including data sharing
  o NRD provided ground water BMP cost-share incentives
  o NDNR’s release of INSIGHT tool for scientific water information
  o Information & Education
    ▪ Irrigation Certification Program
    ▪ Earth Day, Waterfest celebrations
    ▪ Website
    ▪ NRD public awareness survey
2014 Actions & Progress

Studies and Planning

- Completion of remaining IMP components
- ENWRA research & modeling, including collection of AWM data
- LPRB Coalition basin-wide water management planning, including water banking
- LPMT Model development for ground water & hydrologically connected areas
2015 & 2016 Actions

- Expansion of INSIGHT tool
- Continued participation in ENWRA and LPRBC planning
- Continue public outreach
- Monitoring of surface water permits & water use
- Evaluate need for more streamgages
- Monitoring of ground water levels
- Meter wells & require water use reports
2015 & 2016 Actions

- Adopt & implement additional IMP components
- Continue development of LPMT model
- Conduct study of effectiveness & feasibility of water conveyance via streams from upstream sources
- Develop recommendations for development & management of limited aquifers
- Continue discussions on regional water systems and water shortage action plans.
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THANK YOU

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