

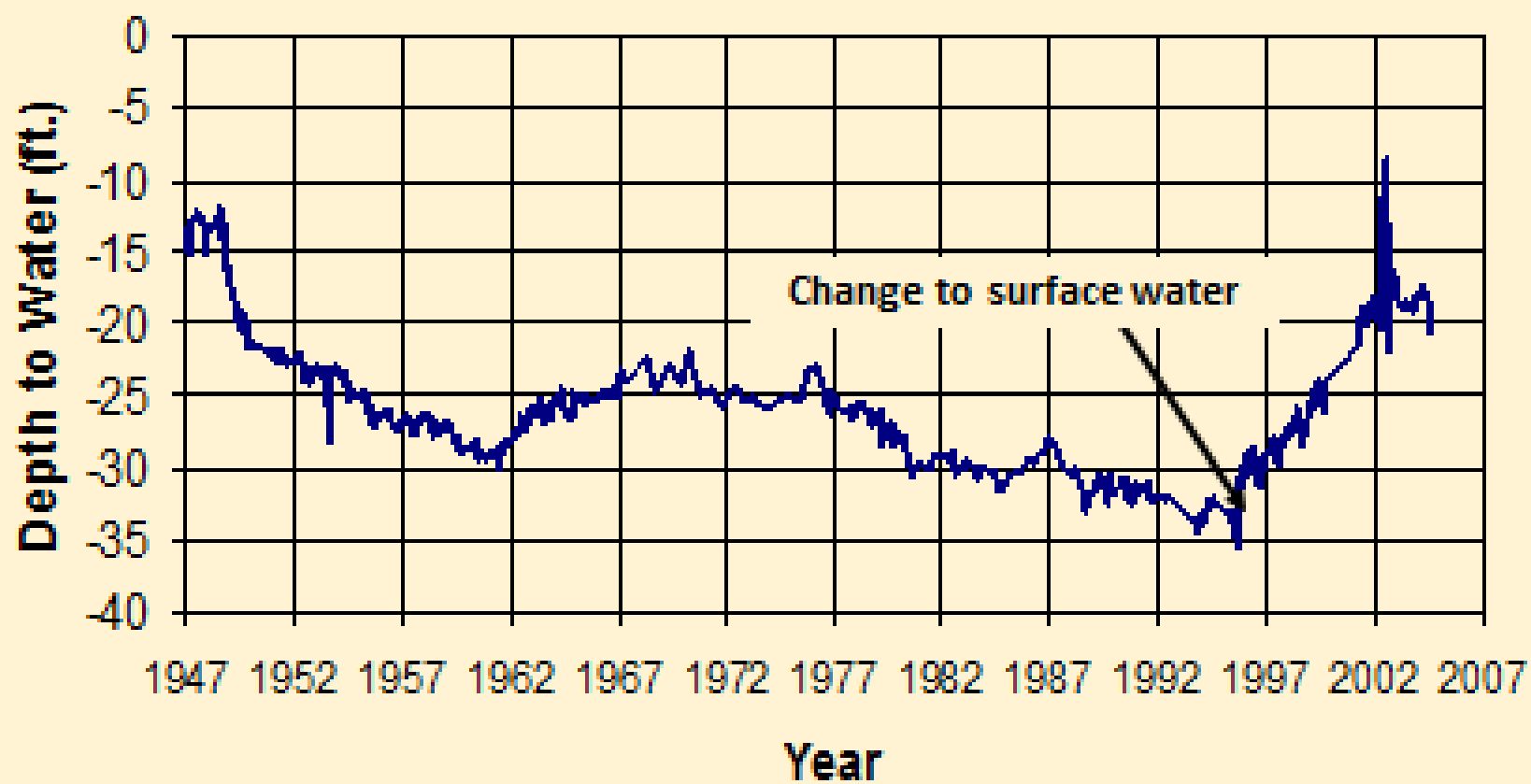


# Buffalo Aquifer Area Water Resource Management Study

Presented by:  
Troy Hall, MPS Water Division Manager  
Wednesday, May 4, 2011



## Ground-water level monitoring well in Buffalo aquifer near Moorhead



# Buffalo Aquifer Management Plan

- Creating an Aquifer Management Plan would
  - Assure a long-term drought water supply for Moorhead and Clay County
  - Assure sustainable Water Resources for Clay County and Moorhead/Dilworth

*4 Plan Development needs the start of the Clay County Atlas and South Buffalo TMDL process.*



## 1. Study Goals and Anticipated Results

## 2. A look at the Required Action Steps

- All Aquifers in Southwestern Clay County
- The Buffalo Aquifer
- The Border Aquifer
- Other Aquifers



# Study Goals and Anticipated Results

- Aquifer Study Goals:
  1. Develop an aquifer model
  2. Determine present and future water needs of all user groups
- Aquifer Management Plan Goals
  1. Aquifer protection
  2. Long-term drought water supply
  3. Sustainable use

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# Study Goals and Anticipated Results

- Anticipated Results
  - Develop and recommend aquifer management plans for present and future generations
    - Solicit input and support from all stakeholders including cities, townships, county, landowners, and the Minnesota Department of Natural Resources.
    - Consider all data and information related to the aquifer and study area.
    - Identify, discuss, and document aquifer issues, opportunities, and management options.
    - Establish priorities for water in the aquifer.
    - Establish static level triggers for water conservation and water use reductions.

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**Action Plan Overview:**  
Clay County Aquifers, the Buffalo Aquifer,  
and the Border Aquifer

Action Plan developed by  
MPS and the MN DNR



# Action Plan: Aquifers in SW Clay County

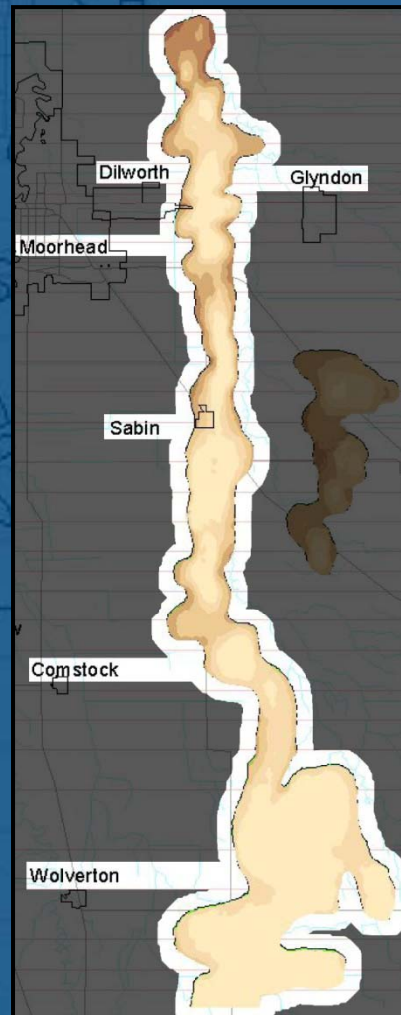
<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
County Atlas Part A	Standard Process	Minnesota Geological Survey (MGS)	Underway
Wilkin County unpublished data mapped	GIS Mapping	Dept. of Natural Resources (DNR)	TBD
County Atlas Part B	Standard Process	DNR	After Part A, 2014
Comprehensive Water Supply Plan for SW Clay County	Draft Plan, Public Comment, Plan Adoption	Clay County, MPS, DNR	December 31, 2020

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# The Buffalo Aquifer



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# Action Plan: Buffalo Aquifer

<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
Identify Project Manager	Need to Identify following MPS retirement	?	Previously identified –need to reassign
Build Cooperating Group	Meetings and public communications	MPS, County, DNR	On-going
Secure funding and in-kind services	Determine amounts, proposals, deliver services, funding obtained	MPS, County w/assistance from DNR, MGS, USGS	On-going (LCCMR, Section 319 funds, other sources?)
Identify permitted water use in Clay County	Database search, map preparation	DNR	TBD

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# Action Plan: Buffalo Aquifer

<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
Communications Website	Identify options, obtain expertise, develop site, go live, keep updated	MPS – will be new contact for web updates	Developed with maintenance ongoing
Summarize past studies	Review and report	USGS or DNR	TBD
Ground water level monitoring both	Standard monitoring protocol	MPS, County, DNR	On-going
Determine need for further aquifer location verification	Review data and confer	MGS, NDR, USGS	TBD

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# Action Plan: Buffalo Aquifer

<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
County Well Index (CWI) well locations	Survey (x,y) wells in CWI & use LIDAR	MPS, County, MGS	Complete
Stream flow gauging and TMDL data collection	Identify existing data, establish new locations, collaborations	DNR, Dept, of Ag, MPCA	TBD
Identify water sources that could be impacted by pumping	Review and analyze data collected	DNR, USGS	TBD
CWI well locations	Verify known well locations, find un-located wells	MGS (County Atlas Part A, phase 1)	Complete

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# Action Plan: Buffalo Aquifer

<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
Chemical sampling wells	Gather existing data, standard sampling protocol	MPS, County, Dept of Ag	TBD
Additional monitoring to define aquifer (if needed)	Standard exploration drilling	MGS or DNR	TBD
Resources test and analysis	Standard resources (aquifer) test	DNR	TBD
Modeling of scenarios	Incorporate data, identify scenarios, run model	MPS, DNR	TBD, 2014

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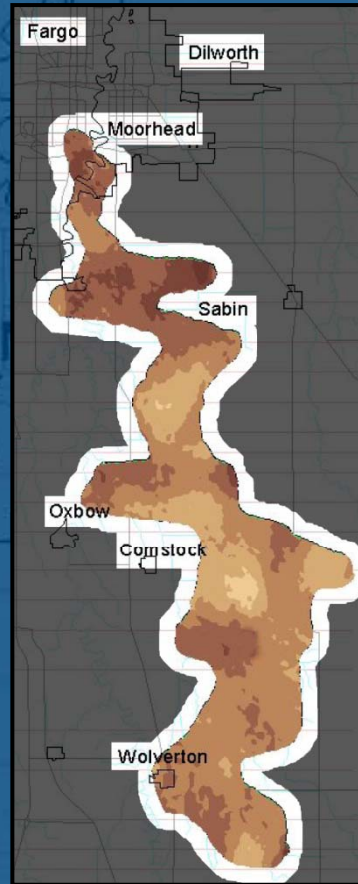
# Action Plan: Buffalo Aquifer

<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
Prepare draft Buffalo Aquifer Plan	Report preparation	MPS, DNR, County	TBD
Public review and adoption of Aquifer Management Plan	Adoption plan prepared, adopted by DNR, MPS, and County	MPS, DNR, County	TBD, 2015

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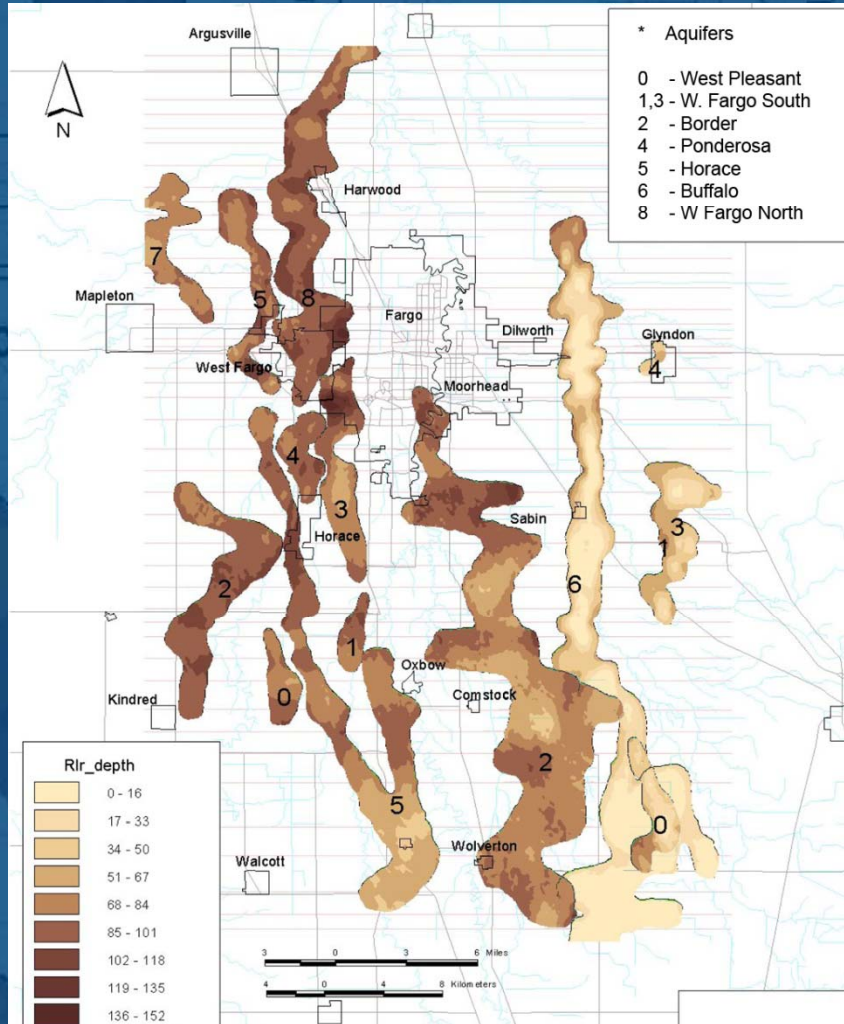
# The Border Aquifer



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# The Border Aquifer



## Aquifers

<b>0</b>	<b>West Pleasant</b>
<b>1,3</b>	<b>W. Fargo South</b>
<b>2</b>	<b>Border</b>
<b>4</b>	<b>Ponderosa</b>
<b>5</b>	<b>Horace</b>
<b>6</b>	<b>Buffalo</b>
<b>8</b>	<b>W. Fargo North</b>

### Aquifer Key



# Action Plan: Border Aquifer

<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
Locate wells in aquifer	CWI search	MPS, NDR	Complete
Well locations	Survey (x,y) wells	MPS, County	Complete
Chemical sampling wells	Standard sampling protocols	MPS, County	TBD
Water level monitoring	Standard monitoring protocols	MPS, County, DNR	On-going
Review of Border Aquifer as water supply	Review and analyze data	DNR, MPS, County	TBD





# Action Plan: Other Aquifers

(east of Moorhead, if found)

<u>Action</u>	<u>Steps</u>	<u>Who</u>	<u>Date</u>
Test and explore additional aquifers	Following completion of Part A of County Atlas	TBD	June 30, 2019

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Home Page

Official Website of the  
**Buffalo Aquifer Management Plan**






Home Page   Public Input   The Action Plan   Participating Organizations   Documents and Resources   Latest Updates   Contacts

**The Buffalo Aquifer**  
Below is a map of the Buffalo Aquifer.



**Welcome to the Buffalo Aquifer Management Website**

**Welcome to BuffaloAquifer.com**  
Beginning in 2008, Moorhead Public Service and the Minnesota Department of Natural Resources began working on a plan focusing on long-term drought. This website is a result of that plan and has been created to offer as much information as possible, keep the public involved in the process, and offer opportunities for input.

**Latest Updates**

Website Launched!

**About the Buffalo Aquifer**

**What is an aquifer:**  
Simply stated, an aquifer is an underground lake, it is a place where groundwater can be drawn through the placement of wells.

**Where is the Buffalo Aquifer:**  
The Buffalo Aquifer is located in Clay county and runs from north of, and runs east of, Dilworth. This aquifer runs south into Wilkin County. A map of the aquifer can be found by clicking here.

**Storage in the Buffalo Aquifer:**  
The Buffalo Aquifer currently has plenty of water. It is estimated that the Buffalo Aquifer is holding over 200 million gallons of water.

**Why Create an Aquifer Management Plan?**

There are two main objectives of a Management Plan for the Buffalo Aquifer:

1. Assure a **long-term drought water supply** for Moorhead, Dilworth and all of Clay County
2. Assure **sustainable water resources use** for Moorhead, Dilworth, and all of Clay County

Read more... >>

**The Anticipated Results**

The results of all studies is anticipated to develop and recommend aquifer management plans for present and future generations. This will be accomplished by:

- Soliciting input and support from *all stakeholders* including cities, townships, county, landowners, and the Minnesota Department of Natural Resources.
- Considering all data and information related to the aquifer and study area.
- Identifying, discussing, and documenting aquifer issues, opportunities, and management options.
- Establishing priorities for water in the aquifer.
- Establishing static level triggers for water conservation and water use reductions.

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# Dirty Jobs with Mike Rowe



May 4, 2011







**Buffalo Aquifer Area Water Resource  
Management Study**

**Thank you for your time**

**Questions**

